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JOURNAL *of* EDUCATIONAL RESEARCH

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COMMON AND DIFFERENTIAL FACTORS IN READING VOCABULARY AND HEARING VOCABULARY

IRVING H. ANDERSON and GRANT FAIRBANKS
State University of Iowa

THE purpose of this study is to determine the relationship between the abilities to understand words read and heard. Genetically, words are first encountered and learned in auditory experience. In the course of reading development, the visual forms of these words become associated with their sounds so that a sight vocabulary, based upon a knowledge of words heard, is gradually accumulated. And since words which an individual learns in auditory experience are also encountered in reading material, in time a sight vocabulary should be accumulated which more or less duplicates the hearing vocabulary. Since there is a high correlation between reading vocabulary and reading ability, one should expect that this overlapping is most complete in good readers. On the other hand, one might suspect that poor readers recognize the meaning of more words when they hear rather than read them.

An investigation of these hypotheses is important. If the hearing vocabulary of poor readers is found to be superior to their sight vocabulary, the enlargement of a vocabulary effective in reading is seen as a definite possibility. This may be accomplished by remedial training designed specifically to translate hearing vocabulary into sight vocabulary.

PROCEDURE

The subjects for this study were 220 freshmen from the academic year 1935-36, chosen at random from the class list. Scores on the *University of Iowa Qualifying Examination*, of which the *Iowa Silent Reading Test* is a part, were available for all subjects.

As the test of reading vocabulary, Form C of the *Inglis Tests of English Vocabulary* was used. The *Inglis Tests* are primarily designed to test the student's reading vocabulary rather than the one he ordinarily

uses in speaking and writing.[1] Each form consists of 150 sentences or expressions in each of which one word is in italics. Following each sentence or expression are five words. The student is instructed to select and underline that one of the five words which most nearly corresponds in meaning to the word italicized in the sentence or expression.

An unselected sample of 50 items from Form B of the *Inglis Tests* was recorded phonographically and used to test hearing vocabulary. The test was recorded as follows: A trained speaker read the standard sentence or expression and after an interval of three seconds repeated this reading, substituting the first comparison word for the italicized word; then, after an interval of five seconds, the original expression was read again, followed in three seconds by the same expression with the second comparison word substituted; after another interval of five seconds, this procedure was repeated for the third comparison word and so on for all five words. Fifty items, separated by five second intervals, were recorded in this way. High grade phonograph records were secured.

After hearing each pair of sentences or expressions in each item, the subjects were instructed to record *S* if they believed the statements to be the same in meaning, or *D* if they believed them to differ in meaning. Special recording blanks were used. The subjects were further told that only one pair of the five sentences or expressions in each item was correct.

TABLE I

CORRELATION BETWEEN READING VOCABULARY AND HEARING VOCABULARY AND THE CORRELATIONS BETWEEN BOTH VOCABULARY TESTS AND (1) TOTAL COMPREHENSION SCORES ON THE IOWA SILENT READING TEST AND (2) COMPOSITE SCORES ON THE UNIVERSITY QUALIFYING EXAMINATION*

	Hearing vocabulary	I. S. R. T.	U. I. Q. E.
Reading vocabulary	.80 ± .02 .95 ± .01	.80 ± .02 .87 ± .01	.70 ± .02 .78 ± .02
Hearing vocabulary		.61 ± .03 .71 ± .02	.60 ± .03 .72 ± .02

*Beneath each coefficient is shown the same coefficient corrected for attenuation.

The odd-even reliability of the test was .64. This coefficient is raised to .78 by the Spearman-Brown 'prophecy' formula. Although the reliability of the test is not high enough to justify individual prediction, it is easily high enough to permit group comparisons. In order to make scores on this test comparable to those on the reading vocabulary test, they were multiplied by three.

[1]For a complete account of the purpose and development of the tests see *The English Leaflet* for October, 1923.

The two vocabulary tests were administered to small groups at a time on separate days.[2] The usual precautions were taken to prevent copying, and to obtain strict attention and obedience to instructions.

RESULTS

1. *Relationship between reading vocabulary and hearing vocabulary.*—Table I presents the correlations between scores on the tests used. The coefficient of .80 (corrected for attenuation, .95) between the reading and hearing vocabulary tests is unusually high. Since comprehension is common to both measures, central factors must account for the close relationship between the two. Not only is the correlation high, but the numerical difference between group means for the two measures is that between 90 (weighted score) on the test of hearing vocabulary and 92 on the test of reading vocabulary. It appears that vocabulary ability is a general function which, on the average, operates independent of the mode of presentation of material.

The present results are interesting in that they correspond so closely to those reported by Young,[3] who found a correlation of .80 (corrected for attenuation, .90) between the comprehension of heard and of read contextual material. The fact that he did not find a higher correlation than that found here for vocabulary ability alone, suggests that the ability to recognize the meaning of words plays a very prominent part in the more complex processes of reading and hearing comprehension.

2. *Relationship of vocabulary to reading ability and intelligence.*—The correlations in Table I indicate that the relationship between both measures of vocabulary and the *Iowa Silent Reading Test* and intelligence, as this capacity is measured by the *University of Iowa Qualifying Examination*, exclusive of the reading test, is high.[4] The correlation between reading vocabulary and reading ability was significantly higher than that between hearing vocabulary and reading ability. The difference between the observed correlations was 5.27 times the $PE_{diff.}$ while that between the corrected figures was 7.16 times the $PE_{diff.}$ This is to be expected, since the reading vocabulary test was given under conditions

[2] The testing was accomplished with the coöperation of Dr. Harry G. Barnes, Associate Professor of Speech.

[3] Young, W. E. "The Relation of Reading Comprehension and Retention to Hearing Comprehension and Retention," Thesis, University of Iowa, 1930.

[4] The use of this examination as a measure of intelligence is justified by the fact that the correlations between scores on this test and scores on other tests of adult intelligence are as high as the correlations between most standardized intelligence tests.

much more representative of the normal reading situation than were the conditions under which the test of hearing vocabulary was administered.

Under the conditions of our experiment, reading vocabulary is also more closely related to intelligence than is hearing vocabulary. The fact that the *Qualifying Examination* requires the reading of questions and directions explains this finding in part. The difference is not, however, absolutely reliable statistically, being only 2.77 times the $PE_{diff.}$ for the raw coefficients and 2.12 times the $PE_{diff.}$ for the corrected coefficients. Since the composite *Qualifying Examination* measures other abilities in addition to reading, the decrease in the difference might be accounted for on this basis. Since reading vocabulary is more closely related to reading ability than is hearing vocabulary, when the two related variables are correlated with a variable somewhat independent of reading the difference between the coefficients would tend to decrease.

Table I shows that reading vocabulary is correlated higher with reading ability than it is with intelligence. The *Inglis Tests* are so constructed that, although the comparison words occur discretely, the standard word appears underlined in a short, meaningful phrase. Since the standard word appears in context, vocabulary is tested under conditions approximating normal reading. As a result a high correlation exists between reading vocabulary, measured under these conditions, and general reading ability. On the other hand, the *Qualifying Examination* calls upon abilities some of which are not common to reading ability. Naturally the correlation between reading vocabulary and intelligence is not as high as the correlation between reading vocabulary and reading ability. The chances in 100 that the true differences between correlations are greater than zero are 99 and 100 for the raw and corrected coefficients, respectively.

When hearing vocabulary is correlated with reading ability and in-

TABLE II

DIFFERENCES BETWEEN MEAN READING VOCABULARY SCORES (M1) AND MEAN HEARING VOCABULARY SCORES (M2) FOR POOR, MEDIAN, AND GOOD READERS, AND THE SIGNIFICANCE OF EACH DIFFERENCE*

	N	M1	M2	r	σ diff.	Diff. / σ diff.	Chances
Poor readers	32	64 15.8	72 9.7	.50	2.44	3.28	100
Median readers	36	94 16	89 10.6	.75	1.78	2.81	100
Good readers	33	117 16.3	107 18.5	.64	2.59	3.86	100

*In the table the SD for each distribution is placed immediately beneath the mean.

TABLE III

THE CRITICAL RATIOS FOR THE DIFFERENCES EXISTING BETWEEN ANY TWO MEANS OF THE THREE GROUPS FOR READING VOCABULARY AND HEARING VOCABULARY*

Comparison	Reading vocabulary Diff. / σ diff.	Chances	Hearing vocabulary Diff. / σ diff.	Chances
Poor and median groups	7.77	100	6.91	100
Median and good groups	5.90	100	4.89	100
Poor and good groups	13.32	100	9.59	100

*The data from which these figures were computed are contained in Table II.

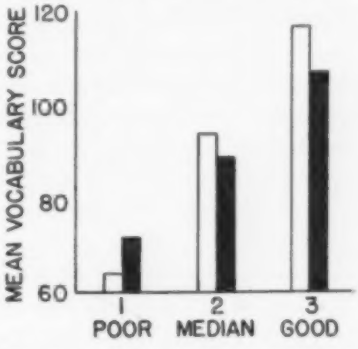


FIGURE I. MEAN READING VOCABULARY SCORES AND MEAN HEARING VOCABULARY SCORES FOR POOR, MEDIAN, AND GOOD READERS

Legend: Open bars, reading vocabulary; solid bars, hearing vocabulary.

telligence the two coefficients are practically identical (Table I). The differences are only .24 and .35 times the PE $_{diff.}$ for the observed and corrected coefficients, respectively. Expressed in terms of probability the chances are practically even, 55 and 59 in 100, that the true differences are greater than zero.

3. *Group differences in reading vocabulary and hearing vocabulary.*—Table II gives the mean hearing and reading vocabulary scores for the lowest, median, and highest fifteen percentiles in reading ability. Mean vocabulary scores increase with each increase in reading ability. The amount of the increase from group to group is highly constant, more so for reading vocabulary than for hearing vocabulary. Table III shows that the amount of increase from group to group for both measures of vocabulary is statistically significant, the difference in all mean comparisons being 4.89 or more times the SE $_{diff.}$

Table II shows also that the lowest fifteen percent in reading ability scored higher in hearing vocabulary than in reading vocabulary. In

the median and superior groups, however, this relationship is reversed, the group means in each case being higher for the reading vocabulary.[5] These results are shown graphically in Figure I. The differences between mean vocabulary scores for the poor, median, and good groups are statistically significant, being 3.28, 2.81, and 3.86 times the $SE_{diff.}$ respectively.

The *Inglis Tests* sample a body of vocabulary more typical of reading material than of conversation. Many of the words in the tests are rarely, if ever, encountered in ordinary conversation. The purpose of the tests is primarily to measure the student's reading vocabulary rather than the one he ordinarily uses in speaking and writing. Thus, a reading vocabulary may be acquired of words which a person has never heard unless he has pronounced them to himself while reading. Since mature readers do not vocalize in their silent reading, it is entirely possible for them to develop a sight vocabulary which does not perfectly overlap or duplicate their hearing vocabulary. The fact that the median and good readers made significantly higher scores on words read rather than heard, suggests that one characteristic of their superior silent reading ability is their reading knowledge of words of which they do not have active command.

Bond[6] has found a significant difference between good and poor readers in auditory acuity, auditory discrimination, and auditory perception. These handicaps in poor readers would hinder the development of hearing vocabulary more than reading vocabulary. Yet in spite of these auditory limitations, poor readers recognize more words which are representative of reading material when they hear rather than read them. Thus, in contrast to good reading, the question with poor readers

[5]Since the hearing vocabulary test was presented from phonograph records which the subjects heard only once, the above results might be criticized as being artifacts of method. The fact, however, that the group mean scores for the two vocabulary tests were so comparable—90 for the hearing vocabulary test as compared to 92 for the test of reading vocabulary—suggests that the hearing vocabulary scores were not, on the average, unduly influenced by the conditions of the experiment.

Furthermore, poor readers, because they are also less intelligent, should be penalized most by the difficulties under which a test is administered. Yet in spite of this possibility, poor readers made significantly higher scores on the hearing vocabulary test than on the test of reading vocabulary. Therefore, it seems reasonable to assume that the results for poor readers at least, and probably for good readers, too, in so far as they differ from the central tendency of the group as a whole, are real rather than artifacts of method.

[6]Bond, Guy L. *The Auditory and Speech Characteristics of Poor Readers.* Teachers College Contributions to Education, No. 657 (New York: Teachers College, Columbia University, 1935), p. 48.

is not why their hearing vocabulary is superior, but why their reading vocabulary is inferior.

The superiority shown by good readers in mean vocabulary scores is due to their knowledge of many of the more difficult words in the *Inglis Tests*. And since these are the words more likely to occur in reading material than in conversation, good readers, because of their rather extensive reading experience, are likely to have encountered them often in reading although they may never have heard them. For this reason good readers recognize many of these words in their visual form only.

On the other hand, it is reasonable to assume that poor readers made their scores on the more simple and common words in the *Inglis Tests*. Although these words occur frequently in reading material, they are also the ones most likely to be used in ordinary conversation. Since poor readers, in general, either avoid reading situations or have not had extended opportunities to read, it is possible for them to have learned more words in hearing rather than in reading experience. For this reason poor readers may encounter many words in their silent reading which they cannot recognize visually although they may understand these words in hearing them.

From a clinical point of view, the above analysis is important. Word-blindness is a condition in which the sight of the word alone does not arouse any feeling of familiarity. It frequently takes the form of an inability to associate the visual symbol with the proper sound of the word. If the individual is able to attack the word phonetically, and if he then recognizes the word in its auditory form, after a few more presentations, the sight of the word alone should carry the meaning. The difficulty occurs in those individuals who, because of an inadequate foundation in phonics, cannot attack strange words correctly. In these cases remedial work in reading requires instruction and drill in phonics. The results of this study seem to indicate that not only children, but also a considerable number of adults are in need of this type of training.

SUMMARY AND CONCLUSIONS

Two hundred and twenty university freshmen were tested as to their ability to recognize words read and heard. Form C of the *Inglis Tests of English Vocabulary* was used to measure reading vocabulary, while an unselected sample of 50 items from Form B of the *Inglis Tests* was recorded phonographically and used to test hearing vocabulary. The re-

lationship between reading vocabulary and hearing vocabulary ability was determined; the correlations between scores on both vocabulary tests and scores on the *Iowa Silent Reading Test* and the *University of Iowa Qualifying Examination* were obtained; and a comparison of the relative vocabulary abilities both within and between groups of good, median, and poor silent readers was made. The results were as follows:

1. The correlation between scores on the reading vocabulary test and scores on the test of hearing vocabulary was .80 (corrected for attenuation, .95). The group mean score on the reading vocabulary test was 92 as compared to the weighted mean score of 90 on the test of hearing vocabulary. These results support the conclusion that vocabulary ability is a centrally determined function, operating, on the average, independent of the mode of presentation of material.

2. A correlation of .80 (corrected for attenuation, .87) was found between reading vocabulary scores and *Iowa Silent Reading Test* scores, and a coefficient of .70 (corrected for attenuation, .78) between reading vocabulary scores and scores on the *University of Iowa Qualifying Examination*. The correlations between scores on the hearing vocabulary test and scores on both the *Iowa Silent Reading Test* and *University of Iowa Qualifying Examination* were .61 (corrected for attenuation, .71) and .60 (corrected for attenuation, .72), respectively. Thus, although reading vocabulary is correlated more closely with reading ability than with intelligence, it is more intimately related to both reading ability and intelligence than is hearing vocabulary. The correlation between hearing vocabulary and reading ability is practically identical with that between hearing vocabulary and intelligence.

3. Significant differences exist between any two means of the three sub-groups for both reading vocabulary and hearing vocabulary. The amount of the increase in mean vocabulary scores is very constant, being more so for the reading than the hearing vocabulary. Poor readers scored higher in the hearing than in the reading vocabulary test. On the other hand, the group means for median and superior readers were higher for the reading vocabulary. It is concluded that while superior silent reading ability is characterized by reading knowledge of words which are not ordinarily used, one attribute of poor reading is inability to recognize words visually, although the reader may understand these in hearing them.

A REPORT OF FOUR STUDIES IN ARITHMETIC

F. B. KNIGHT
State University of Iowa

INTRODUCTION

THE following reports are of investigations dealing with different problems and using different techniques. Space limitations have enforced exceedingly compressed context, without, it is hoped, unduly sacrificing clarity. The study of the relative perceptual value of various number configurations was done by J. J. McNamara. The report on the attempt to introduce tri-dimensional space into primary number teaching is the work of Jeanette Harter. The study on the "sociology" or setting of verbal problems, by Mildred Scott, is admittedly subjective, but many readers will agree that organized subjective opinion is perhaps some improvement over the present haziness surrounding the setting of verbal problems. The appraisal of illustrations in textbooks, by W. M. Ernst, suggests a problem related to our control of learning in arithmetic—a phase of text construction which will probably be taken far more seriously as time goes on.

The four students of arithmetic listed in the preceding paragraph carried out their studies in the Arithmetic Laboratory of the State University of Iowa. They are representative of a larger group of experienced teachers, supervisors, and superintendents engaged in research in the hope of contributing little by little to making the child's study of arithmetic more effective and more tolerable to him.

AN EXPERIMENTAL STUDY OF THE RELATIVE PERCEPTUAL VALUE OF VARIOUS CONFIGURATIONS OF THE NUMBERS SIX TO TWELVE INCLUSIVE

This is an experimental study of the relative perceptual value for concrete number situations in the second, third, and fourth grades, of various number configurations. Three kinds of materials were used—dots, splints, and dolls, each kind of material representing, in linear, diamond, and domino patterns, the numbers six to twelve, inclusive. Dolls were introduced to represent "real" things as opposed to conventional abstractions and to make available partial study of three-dimensional groupings. The problem thus involves a study of seven numbers, each in nine con-

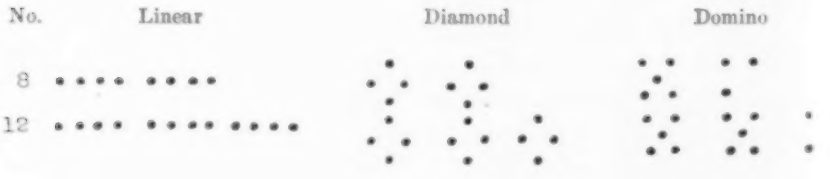
figurations. It is assumed that the material and configuration in which the number of objects is most easily perceived will also be superior for the presentation of concrete number to children.

Groups of children were selected from classes in which instructional material of the three types used in this experiment had not been stressed. A limitation was inherent in the two- and three-dimensional nature of the materials themselves, for, although care was taken to keep the contrast between figure and ground constant, it is doubtful whether the dolls photographed in as great a contrast to their black background as did the white dots and splints.

It was assumed: (1) that the effect of previous experience with, and immediate practice on, one material, pattern, configuration, or number was reduced by presenting all of them in heterogeneous or random order, and by reversing the order of presentation for half the experimental group; and (2) that the children used in the experiment had reached the stage of maturity in dealing with concrete number in which they had made or were making the transition from partial to unity grouping of the numbers six to twelve.

The dots, splints, and dolls were photographed at an angle. A total of sixty-three pictures of these objects was taken on a flat table covered with black paper. All photographs were 3″ x 6″.

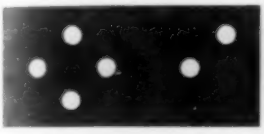
The following arrangement was adhered to in the case of the dots, and in the case of the splints and dolls, was varied only so far as perspective demanded. Appearance of two of the numbers in the series from six to twelve in the three types of patterns using dots is shown below. The appearance of the other numbers may be inferred from these. If any one pattern can be shown to be superior, that, of course, is the one to be used in the practical work of textbook and blackboard illustration.



The photographs were exposed in a Whipple tachistoscope, with rotating pendulum controlling the period of time the photographs were exposed. The only movement visible to the subject was the moving shutter

as it permitted or cut off the view of the photograph. One-hundred children comprised the experimental group; thirty-two from the second grade, thirty-three from the third, and thirty-five from the fourth grade. The data for this study are based on 6300 pupil reactions to one-second tachistoscopic exposure. Samples of the photographs are reproduced below.

The Number Six (Dots in diamond pattern)

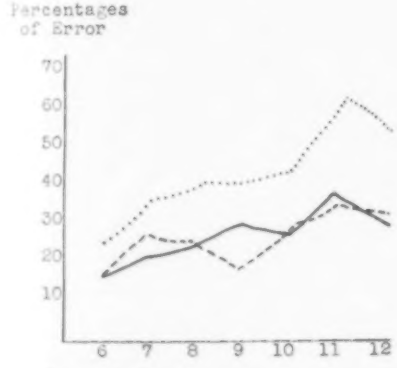


The Number Six (Splints in linear pattern)

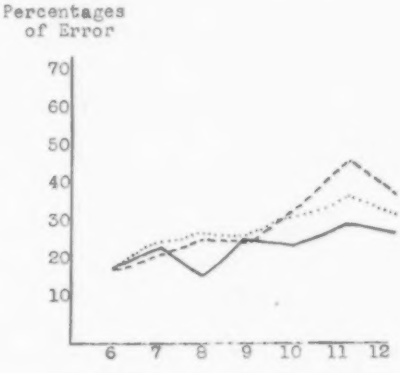
The Number Six (Dolls in linear pattern)

The entire sixty-three photographs were presented in heterogeneous order to each child for an exposure of one second each. The experimental group was divided into couples, the order of presentation being reversed for alternate couples. Each pupil entered his estimates in digits on record blanks. The total testing time, including rest periods, occupied about twenty-five minutes for each child.

The percentage-of-error technique was used in determining all results, the basic theory being that numbers most easily perceived in the photographed configurations were least missed by the total group.



GRAPH I



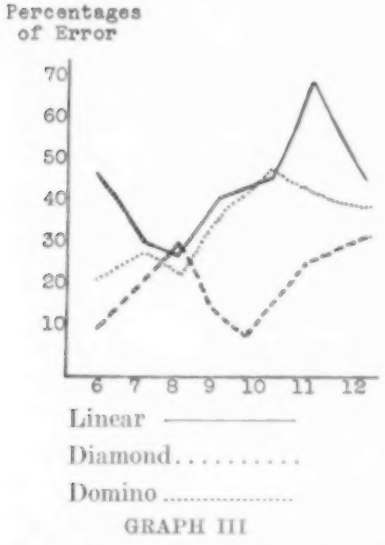
GRAPH II

Graphs showing percentages of error made by the entire group in perceiving the number represented in each of the sixty-three photographs show a wide range of variation, with 82 percent error for the number 11, presented by dolls in the linear pattern, and only 7 percent error for the number 10, presented by dots in the domino pattern. The mean percentage of error for all photographs was 29.7.

Mean percentages of error for each number in all configurations are shown by grades in Graph I, below. A general growth in power to read number configurations accurately is evident.

Data on the possible superiority of large dots, splints, or dolls are shown in Graph II, which reports the average performance of 100 pupils.

Little advantage is seen in one material over another for any one grade or for the entire group. Dots seem, however, to have a slight advantage.



GRAPH III

Data on the possible superiority of the configurations—dots, dominoes, or diamonds—are shown in Graph III, which is based on the average performance of 100 pupils.

The domino is superior for all numbers except 8. Dots arranged in the domino pattern showed the smallest mean percent of error, dots in the linear pattern, the largest.

The data show that there is little difference in the directions of error. Errors of over-estimation were slightly more frequent and larger. Approximately 42 percent of the cases gave too small a number and 58 percent, too large an estimate. The mean error of over-estimation was 2.2 units. The mean error of under-estimation was 1.8.

The number 11 is of especial difficulty in almost all configurations and materials.

The data of this study support the following practical suggestions. In presenting number patterns to children: (1) use large dots in domino configurations; (2) enrich the number 8 by using the diamond configuration; and (3) give special attention to the number 11.

TRI-DIMENSIONAL SPACE AS AN AID IN TEACHING PRIMARY ARITHMETIC

The need for pictures in the primary grades to stimulate interest, fix attention, and clarify meaning has long been recognized in many school subjects, notably reading. Recent, and apparently successful practices in primary arithmetic, consider an understanding of the meaning of number names, number relationships, and the primary combinations fundamental to satisfactory achievement. The teacher of beginning arithmetic today considers that a given number should be learned not merely as the name for a symbol, but also as a definite quantity value, holding a definite place in a series. Tendencies in recent psychological thought suggest the wisdom not only of bringing forth 9 as a response to 4 plus 5, for example, but also of attaching to 4-5-9 a genuine sense of reality and reasonableness. To substantiate such a theory by controlled experiment, one must first make available, in form practicable for classroom use, number situations which can be studied by groups. To this end, the investigator built a set of forty-eight pictures designed to introduce the child in a leisurely manner to the number facts and to quantitative concepts, so that the child could study the 100 addition and the 100 subtraction facts in the sense of "discovering," verifying, and gaining a sense of their reality.

Illustrations in classroom arithmetic books are commonly mere outline sketches which furnish social setting only and have questionable quantitative value and child appeal. Although recent books show improvement in number and size of pictures and in clearness of meaning, few illustrate by means of pictures any but the easier number combinations, leaving the harder ones to be understood by inference. This study challenges such a pedagogy and supplies photographs to illustrate and give meaning to the harder combinations. It provides the necessary material for putting to experimental test the following very real dispute in the teaching of primary numbers: A method best calculated to teach the 100 addition and the 100 subtraction facts may be one, but not both, of the following:

Method A

This method is in common practice today under a variety of names and disguises. It advocates teaching a few of the easier facts by letting the child "see," through illustration, that these facts are really so (the pedagogy of discovery), then shifting to the pedagogy of authority and drilling for the harder facts. The reasonableness of the harder facts is not considered a useful dynamic of learning, or will be inferred from discovery and experience with a few of the easiest facts, or will be taken for granted because the teacher and the book vouch for it.

Method B

This method does not deny the efficacy of drill but insists that drill alone involves an unnecessary refusal to use other dynamics of learning, particularly, independent discovery of the truth about harder, as well as easier, addition and subtraction facts. Learning will be superior on most, if not all counts, if pictures or other situations allow the child to see for himself the truth and reasonableness of a generous sampling of harder facts in contrast to illustration of the easiest facts only.

Method A would allow "discovery and verification" pictures at the beginning of learning the number facts by showing that $2 + 1$, $4 + 2$, or $3 - 2$, represent real situations, but would teach $5 + 7$, $9 + 8$, $17 - 9$, or $16 - 7$ by giving the answer to each and then drilling and drilling.

Method B would also drill, but would use illustrations to show that $5 + 7$, $9 + 8$, $17 - 9$, or $16 - 7$ actually have reality, and would allow the child to discover and verify answers to these harder combinations as often as in the case of $2 + 1$, $4 + 2$, or $3 - 2$. This is a real dispute, and theoretical considerations should be supplemented by scientific data. To test Method B requires the availability of situations adequately illustrating every combination as it might actually occur.

By sheer trial and error, photographs were taken and retaken until they could be shown to be understandable to first-grade children. The situations used sample generously into the child's experiences in real and in play activities, and make some pretense of giving meaning to the vexatious zero combination. The following subjects appear in the photographs: dolls, chickens, blocks, toy automobiles, apples, hands, children in play activity and in classroom groups, balloons, muffins, china dogs, books, boats, stick candy, balls, sand buckets, toy rabbits, toy camels, toy goats, ice cream cones, milk bottles, a tea service, eggs, crayons, a birthday cake, nails and hammers, and coins. There are forty-eight photographs in all.

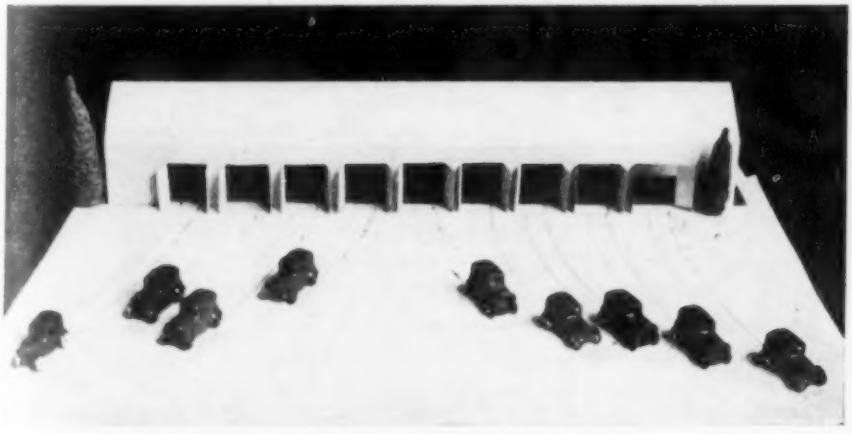
The beginnings of column addition are illustrated by such pictures as the one of children at a playground, with 2 in one swing, 1 in another

swing, 1 swinging on a bar, 2 sitting on a bar, 1 in a chicken yard, 3 at one side of the chicken yard, and 5 at another side. These groups suggest $2 + 1 + 1 + 2$, and $1 + 3 + 5 = ?$ also, $9 + 6$, $6 + 9$, $15 - 9$, $15 - 6$. Another picture possessing child appeal, suggesting many addition and subtraction combinations, is that of a primary-aged boy driving his eighth nail into a board, while on the table beside him are 4 more hammers and six more nails. Suggested combinations here are $4 + 1$, $1 + 4$, $5 - 4$, $5 - 1$, $6 + 8$, $8 + 6$, $14 - 6$, and $14 - 8$.

A device used effectively for three pictures is a toy garage with 9 compartments, numbered serially over the doors, and with 9 cars. When one car is driven out of the garage and 8 are parked in the entrance, the combinations $9 - 1$, $9 - 8$, $8 + 1$, and $1 + 8$ are evident. When all are driven out (4 in one direction and 5 in another) the combinations $4 + 5$, $5 + 4$, $9 - 4$, $9 - 5$, $9 - 9$, $9 - 4 - 5 = ?$ appear. When 3 are out and 6 are in the entrance, $6 + 3$, $3 + 6$, $9 - 3$, and $9 - 6$ are shown.

A more complex development of this idea shows 16 cars, part dark and part light, of which 9 are parked in groups of 4, 3, and 2, while 4 drive to the right of the picture in groups of 1, 2, and 1—3 more driving to the right in groups of 1 and 2. To the request "Read the numbers in this picture like a book," the child could respond: "$4 + 3 + 2 + 1 + 2 + 1 + 1 + 2 = ?$" Many other combinations, previously illustrated only with abstract symbols, are possible here using concrete materials.

That forty-eight photographs can sample the whole field (in contrast with illustrating only the easiest facts) is best verified from an inspection of the pictures themselves. A specimen picture is here included.



This collection of photographs provides material illustrating the harder as well as the easier combinations. For further studies of this kind, the photographs might be useful in the following:

1. In an investigation of the number of concepts which a child would gain from undirected experience with such a series of photographs.

2. As illustrations for beginners in learning-units of addition and subtraction combinations.

3. As material having variety and child appeal to supplement regular teaching.

4. In an investigation of the learning efficiency of photographs of actual objects compared with artists' illustrations of the same objects.

5. In a test of the rôle of insight in learning. If photographs are found to contribute to the child's understanding of number relationships and his ability to deal with abstract number situations, they automatically become data relevant to the psychological debate on the advantages of understanding *versus* mechanical identification of connections.

THE SOCIOLOGY OF VERBAL PROBLEMS IN FOURTH-GRADE ARITHMETIC

The verbal arithmetic problem should present a snapshot of real life in reasonable perspective. To the pedagogy of the problem are assigned matters of reading difficulty, processes used, complexity of thinking required, and so on. To the sociology of the problem is assigned the matter of the setting of the problem and the worth of this setting, *per se*. To date, more successful attention has been given to the pedagogy than to the sociology of problem material.

In considering a year's supply of problem material, two questions are important:

1. Should verbal problems in arithmetic be miscellaneous and independent of each other—hit-or-miss snapshots of life, as it were, or should they represent a certain amount of quantitative material around one central theme? Miscellaneous problems are much easier to provide, have a long tradition of respectability, and are easily justified in standardized problem-solving tests. Only in school, however, do sane persons jump from one unrelated unit of thought to another. Miscellaneous problems are, psychiatrically speaking, beautiful (or dismal) examples of flight of ideas. Problems organized around a sensible and practical theme or "over-problem" are theoretically far superior. Practically, they require much more ingenuity and imagination than is often available, if their construction is to be genuine, rather than forced, trivial, or fantastic.

2. A second question of sociological import is: What kind of a world should a year's supply of problems present to the child? Should it be a "success story" world, in which ninety-five percent of the profit-and-loss problems show profit in the answer? Should it be a party world, in which birthdays and gifts are the rule and work is the rarity? Should it be a rich man's world, in which parties cost $50, and grandmothers give their grandchildren twenty-five-dollar presents? Should it be a world which makes a pet out of the child, by supplying plenty of neighbors who buy worthless tickets so that the child may have enough money to build a type of boat which only an expert could build?

TABLE I

SOCIOLOGY OF VERBAL PROBLEMS IN TEXTS A, B, AND C

Situations	Total Number of Problems		
	Text A	Text B	Text C
1. Situation child may experience	473	216	500
Situation child may observe	64	77	48
Vaguely within child's experience	74	39	28
Child could not experience	124	57	42
2. Interesting to child	260	127	319
Somewhat interesting to him	319	137	219
Not interesting to child	156	125	80
3. Country setting	60	54	50
City or town	76	89	115
Either	592	245	452
Home	154	108	123
School	176	74	125
4. Present time	705	378	609
Immediate past	6	10	13
Long ago	23	2	22
5. Any locality	638	372	599
Foreign	60	1	20
United States	11	2	7
New England	1	1	0
Middle Atlantic	2	0	0
South Atlantic	6	1	10
North Central	6	15	0
South Central	10	8	0
Plateau	0	0	0
Pacific	0	1	0
6. Upper economic status	5	11	0
Upper or middle	51	76	147
Middle	26	57	55
Middle or lower	23	8	55
Lower	0	7	0
Any class	630	230	361

Situations	Total Number of Problems		
	Text A	Text B	Text C
7. High energy involved	85	50	139
Medium energy involved	53	40	99
Low energy involved	23	12	56
Not action problem	574	287	324
8. Liquid measure	23	15	11
Dry measure	11	8	4
Time	128	33	89
Length	126	50	98
Money	323	209	231
Weight	92	17	22
Degrees of temp.	3	19	11
Area	6	3	0
9. Correlation with:			
Reading	40	4	29
Spelling	4	2	1
History	19	0	23
Geography	56	3	10
Hist. and geog.	3	0	1
Indus. arts	11	7	44
10. Boys	269	158	268
Girls	190	87	232
Children	63	35	49
Men	136	68	82
Women	56	47	77
11. Use of money	120	80	132
Saving	50	19	43
Earning-spending	53	34	41
Earning a living	4	15	6
12. Business	12	41	20
Man's needs	133	71	50
Communication and transportation	95	44	38
13. Play	139	94	150
Nature	15	10	35
Beauty	18	17	11
Health	10	13	6
Total number of problems	735	389	618

To assert that the sociology of the problem does not matter, because the child knows it is only a problem after all, is simply begging the question. We assume that problems do matter, or we would not supply them. Their essential weakness (because they can only be, at best, cold-type reports of life, instead of life itself) is a handicap, to be sure, but never an excuse for tolerating the silly rather than the sensible, the flimsy rather than the robust. Nor is it a justification for pandering to wish-fulfillment, rather than accustoming the child to "the way things really are." The hypothesis that the child does identify himself with the verbal problem is one of the justifications for the problem.

The present study attempts, by analyzing verbal problems in three fourth-grade arithmetic texts of recent date, to discover what kind of world these problems present and how effective this presentation seems to be from the child's standpoint. To this end, verbal problems from the three texts (designated A, B, and C for convenience) totaling 1,742 in number, were analyzed for social implications. No problems were omitted from any of the three texts, unless they were "sample" solutions, problems made up by the pupil, or problems of the direction type. Criteria for judging each problem were determined solely by the investigator—an experienced elementary school principal.

The results of this study appear in Table I.

The categories are self-explanatory, with the exception, perhaps, of Number 7. The term "energy," as applied to these criteria, refers to the relative pressure under which a young child might be placed in identifying himself with the action of the problem. Thus, a cooking lesson at home or school would put a child under reasonable pressure only, but really thinking about 10,000 loaves of bread a day in the kitchens of a mammoth baking industry would rate high in energy. Planning a hut with the neighbor boys would be reasonable in energy cost, but checking the linen requirements of a gigantic hotel would earn a high energy evaluation.

Conclusions from these data are interpreted in percentages below by sections corresponding to the sections in the table.

1. *Possibility of child participation.*—The texts vary widely. Thus, 81 percent of the problems in Text C, 64 percent in Text A, and only 56 percent in Text B deal with situations in which there is likelihood that the child might actually take part.

2. *Interest to the child.*—Serious attempts to interest the child are evident in all texts studied.

3. *Social setting of the problem.*—The bulk of verbal problems are noncommittal as to location. Many useful problems do not require detailed location. However, in general, the less detailed the location, the more vague the problem, and the more vague, the less likelihood is there of the child's identifying himself whole-heartedly with the situation of the problem.

4. *Time of happening.*—Stress of present time on the part of all texts makes identification easy for children, but is naturally not conducive to quantitative historical thinking.

5. *Place of happening.*—A generalized American locality predominates. There is little serious attempt made to use arithmetic in thinking about problems of an international character. Geographical site is not stressed as much as city *versus* country.

6. *Economic status implicit in the problem.*—Many, but not all, problems have an economic inference. In no sense is any text of those studied written for "poor Richard." The affairs of people in moderate circumstances, with an occasional bit of wishful thinking, is the rule.

7. *Energy involved in the situation.*—One text (C) seems to contain a full quota of problems which deal with the very big, very fast, and very large. One is tempted to remark that the child would be exhausted if he identified himself with all the action too successfully.

8. *Denominate numbers used.*—Items of time, weight, and temperature show wide variation from book to book. Predominance of money problems finds a parallel in real life, naturally, but there is the possibility that 54 percent (Text B) is too high an estimate for a child's interests and activities.

9. *Correlation with other subjects.*—No text shows higher than 5 percent of its problems with reasonably direct reference to reading. Text A shows 8 percent with geography, Text C, 7 percent with industrial arts. There is little uniformity among texts in these features, but Text B shows consistently less correlation than do the other two texts studied.

10. *Sex and age of participants.*—Each text shows a more marked predominance of boys and men than vital statistics would warrant. Evidently the world is still a man's world, even in texts.

11. *Use of money.*—Texts B and C each devote 21 percent of their problems to children's buying. Text B stresses earning and slights saving, as compared with the other books.

12. *Recreational items.*—Play and good times are stressed in all texts. There is a more complicated psychology to this than can be elucidated here.

The texts as a whole stressed child interests, an upper middle-class society, the present time, sedentary activity, money, boys and men, and the play element. "Happy days are here again!" if we can believe our textbooks. There was very slight correlation with other school subjects and slight emphasis on exemplary behavior.

Whether the picture of life which each of these texts presents correlated highly with actual child activities and problems is doubtful in many cases, most notably, in items 7, 8, and 11. The emphasis on "here" and "now," in items 4 and 5, makes for child identification but hinders quantitative historical and geographical thinking. Significant also is the relatively slight correlation with other school subjects, suggesting a rigid departmentalization not present in the child's actual life. The unrelatedness of problems, one with another (i.e., the miscellaneous organization which still prevails), is highly objectionable. Of course, an arithmetic text is not a sight-seeing trip through the United States, or a functional diary of life in the home, in the school, on the farm, or in the department store. Still, the arithmetic problem is a snapshot of life, and with 500 snapshots a good deal of life is, or could be, surveyed. Better organization and better selection are both possible and desirable, especially since we are coming to realize that what one learns unintentionally in an arithmetic problem can have a considerable, and more or less lasting, effect.

APPRAISAL OF ILLUSTRATIONS IN FOURTH-GRADE ARITHMETIC TEXTS

The present study sought, by testing pictorial illustrations from eight fourth-grade arithmetic texts of recent, but varying copyright dates, to develop a technique of illustration analysis. Twenty-five fifth-grade pupils and twelve experienced teachers took part in the experiment. Specific aims of the study were the reporting of: (1) The number and size of illustrations in each textbook; (2) the functional use of illustrations according to the classifications (a) used, neglected, or needed in solving a problem, and (b) used only for general social situation; (3) the number of colored and uncolored illustrations; (4) the distribution of illustrations among the various broad social-situation categories; (5) the pupil-appeal and teacher-appeal of each illustration.

From the eight books chosen, all illustrations having an area of one square inch or more were cut from the books, mounted on oak tags, assigned key numbers and grouped into thirty classifications according to the arithmetical skills which the text authors intended to illustrate. These tags were then hung on the classroom wall at about eye-level. The pupils studied them at their leisure, informally, and chose as "best" a number approximately 25 percent of the total in each classification. The child typically chose five or six pictures from a row of twenty to twenty-five. The task did not involve undue complexity or emotional stress, and evidences of enjoyment at "playing judge" were obvious. Instructions given the pupils were, in effect:

> "If you could choose pictures you would like to have in a fourth-grade arithmetic book you were using, which of these pictures would you choose?"

Each pupil recorded his choice by key numbers on the illustrations for each classification on an individual, mimeographed sheet. Analysis of votes showed that the pupil's familiarity with a given picture from previous textbook use in the fourth grade, was a negligible bias factor.

Votes for each illustration were then tabulated from these score sheets, and the 25 percent receiving the highest number of votes in each classification were designated "alpha factors" and a "pupil-appeal quotient" computed from them.[1]

Cumulative records were then prepared for each of the thirty "process" classifications, listing the following data for each text: The key numbers, the use made of data in the illustrations (used, neglected, not needed, used for social situation only), the use or absence of color, the key size based on area, the size and style of type, pupil- and teacher-appeal quotients, and alpha and beta factors.

The data from these charts were then summarized by textbooks into thirty individual-classification summary charts. Eight total textbook summaries were also compiled by classifications. Both alpha and beta

[1] In the case of Classification 22, with 48 illustrations, the 25 pupils chose 12 illustrations. Multiplying 25 (the number of pupils) by 12 gives 300, which, divided by 48, equals 6.25—the average choice for all illustrations in this classification. Of the 48 illustrations, Text G had 6 that received a total of 47 votes, or an average number per illustration of 47/6, or 7.83, which, divided by 6.25, gives 1.25—the pupil-appeal quotient. "Beta factors" and "teacher-appeal quotients" were obtained in the same manner by testing the twelve teachers chosen. The appeal-quotient is a measure of the frequency with which pupil or teacher chooses pictures from one text in competition with other texts, weighted for number of pictures which could be chosen in each text.

factors were summarized by textbooks. Illustrations were classified by texts according to social situation and process.

Table I represents a composite summary based on significant totals from previous summaries of individual charts. In connection with the table, these facts should be noted:

1. The total space given to illustrations varied from 1.9 percent in Text D to 8.3 percent in Text M, an average space of 5.8 percent.

TABLE II

COMPOSITE SUMMARY OF INDIVIDUAL TEXTBOOK CHARTS

1. Textbook		B	D	G	I	J	K	L	M	Total
2. No. of Illustrations		36	13	112	37	27	61	81	78	445
3. Data Used		27	4	63	16	14	30	38	18	210
4. Data Neglected		3				1	2	8	6	20
5. No Data Needed			3	16	4	2	7	13	3	48
6. Data for General Social Setting Only		6	6	33	17	10	22	22	51	167
7. Colored							21	30	32	83
8. Uncolored		36	13	112	37	27	40	51	46	362
9. Size:	1–3 sq. in.	15	2	38	27	7	12	14	14	129
	3–5 sq. in.	11	5	26	6	4	12	14	27	105
	5–7 sq. in.	4	2	16	3	8	15	7	28	83
	7–9 sq. in.	2	4	21		6	15	6	6	60
	9 or more sq. in.	4		11	1	2	7	40	3	68
10. Arithmetic Classification	(1)	6		10	2	1	6	4	6	35
	(2)	1	1	4	1	1	5	2	7	22
	(3)	5	1	6	3	3	7	11	12	48
(See Paragraph	(4)			11	4	1	7	12	23	58
3, above)	(5)	2	4	26	11	9	11	29	11	103
	(6)	19	4	22	11	5	15	6	10	92
	(7)		2	10	3		7	6	2	30
	(8)	3	1	23	2	7	3	11	7	57
11. Social Situations	(1)	1		6	2	1	5	2	4	21
	(2)	1	1	1						3
	(3)	3	1	4	1		11	4	14	38
(See Paragraph	(4)			2	2		7	2	19	32
4, above)	(5)	2	2	1	3	1	3	1	3	16
	(6)	17		2	5	2	7	1	4	38
	(7)				1		1			2
	(8)	3	1	4		4	4	2	2	20
12. Pupil–Appeal Quotient		.93	1.3	.95	.74	.80	1.14	1.07	.81	
13. Alpha Factor		9	5	30	6	6	22	27	19	124
14. Teacher–Appeal Quotient		.77	1.33	1.12	.87	.68	1.01	1.07	.83	
15. Beta Factor		8	3	30	7	5	17	23	15	108

2. The type size used in illustrations varied greatly, but played such a minor rôle in the study that data concerning it are not considered in this report.

3. The thirty arithmetic classifications (Item 10 in Table II) have been condensed into these headings: (1) Addition of Whole Numbers; (2) Subtraction of Whole Numbers; (3) Multiplication of Whole Numbers; (4) Division of Whole Numbers; (5) Fractions; (6) Mensuration; (7) Areas; (8) Miscellaneous.

4. Social situations (Item 11 in Table II) have been summarized as follows: (1) Home—activities in, making things, hobbies, parties; (2) Community; (3) Store; (4) Farm—activities on, animals, pets raised for profit; (5) Travel—automobile problems, vacations, trips; (6) School—activities of classroom, cafeteria, children's weights, puzzles; (7) Games and Athletics; (8) Earning, Selling, and Spending.

The technique of textbook illustration is in its infancy but is already an important factor in book making and selection. Setting up techniques for the objective appraisal of illustrations seems to be a promising, though practically virgin field. While illustrations occupy but a small percentage of the total page area of a book, they exert a powerful influence over buyer- and user-opinion of the book.

The following comments are based upon the foregoing table and the more detailed tables upon which it was built.

1. Many pictures do not pay their way. They are chosen by neither pupil nor teacher when placed in competition with others in the context.

2. Fluctuation of appeal within a text varies greatly. Some texts have a few pictures of marked appeal, with the rest "unwanted" by the choosers. Other texts provide illustrations of more even appeal.

3. Many large pictures in texts are apparently "window dressers." They are not used in the context and could have been placed anywhere in the text. To influence the first casual impression of an inspector of the book seems to be their sole purpose.

4. With one, perhaps two exceptions, the first third of a text is much better illustrated than the rest of the book. Other than pedagogical considerations doubtless account for the fact that a book is at its worst at the time it should be at its best, i.e., in the spring, when pupil and teachers are tired, and the outdoors is a strong competitor for attention and interest.

5. The illustrations supporting or attending the learning of some processes are more frequent and better than others. Subtraction of whole

numbers, for example, often is assigned less drill and less explanation. It is also slighted in the matter of illustrations.

6. It is more than probable that the functional power of illustrations is greater or could be made greater than evident attention to this phase of construction would imply. The newer texts contain evidence, however, that their builders are laying down illustration specifications relative to artistic merit and distribution over processes and social situations comparable in rigor to those used in instruction, drill, and problem construction.

USEFUL FRACTIONS

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WHAT are the useful fractions, the fractions used enough in business and life to justify drill-teaching for mastery?

The efforts at separation of the useful from the useless in arithmetic have been stimulated by several variously motivated influences, among them the following:

1. The realization that the growth of knowledge and the complexities of modern life have greatly increased the school load, and that time on the useless can no longer be condoned.
2. The growing evidence that the doctrine of mental discipline is a false doctrine, and that in any case more wholesome attitudes and better integration take place when the child sees the value of his task.[1]
3. Appreciation of the fact that extreme rationalization of the number system and its social significance is a valuable viewpoint only for the highly intellectual adult; it inhibits and confuses the average child in the grades.
4. Gradual acceptance of Dewey's teachings, that it is experience which gives meaning and permanence. Development of arithmetical knowledge quite beyond experience has little meaning, will not be used, and is soon forgotten.

There may be many approaches to the question as to which fractions are useful enough to justify drill-mastery, and which are relatively useless. But all will agree that fractions have consumed a considerable part of the school time allotted to arithmetic,[2] and the results have been far from satisfactory.[3] All, therefore, must be interested in a spread of data on the occurrence of various fractions in business and social usage.

A summary of previously published data on usage of fractions,[4] re-

[1]Thorndike, E. L. "Mental Discipline in High School Studies," *Journal of Educational Psychology*, XV (January-February, 1924), pp. 1-22; 83-98.

[2]See Courses of Study in Arithmetic, or Textbooks in arithmetic for amount of time or space devoted to fractions.

[3]See any school survey results. On simple, useful drill material, the scores should be perfect (100 percent).

[4]Dalrymple, Charles O. "Fractions in Social and Business Usage," Master's Thesis, Boston University, 1933.

TABLE I

SHOWING THE DISTRIBUTION AND FREQUENCY OF OCCURRENCE OF FRACTIONS FROM PREVIOUS STUDIES

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Fraction	Wilson Study	Wise Study	Melrose Study	Edward Everett School Study	Boston Study	Mitchell Study (Cook Book)	Mitchell Study (Wages)	Woody Study	Total	Percentage
1/2	1,289	837	51	275	2,534	1,127	528	958	7,599	60.247
1/4	159	84	10	8	80	718	292	345	1,696	13.446
3/4	189	63	12	5	68	225	15	87	664	5.264
1/3	119	49	5	2	35	353	130	120	813	6.446
2/3	54	39		1	11	116	13	32	266	2.109
1/5	10	5			2			1	18	.143
2/5	15	3							18	.143
3/5	4	3		1	1			1	10	.079
4/5	13	3			1				17	.135
1/6	6	8	9	1	5		18	227	274	2.172
2/6	1								1	.008
4/6	1								1	.008
5/6		4			1		8		13	.103
1/7	3	4							7	.055
2/7		2							2	.016
3/7		2							2	.016
6/7	1								1	.008
1/8	13	14	3	1	12	105		17	165	1.308
3/8	20	5		1	7	1		3	37	.293
5/8	8	3			14			3	28	.222
7/8	4	7			8	21		12	52	.412
1/9	2								2	.016
2/9	2		1						3	.024
4/9	3	1						2	6	.048
5/9		1						2	3	.024
6/9	1								1	.008
8/9		3							3	.024
1/10	8	1			1			18	28	.222
2/10	4	3							7	.055
3/10	2	2		1	1				6	.048
4/10		2							2	.016
6/10	3	1							4	.032
7/10	8	1							9	.071
8/10		1							1	.008
9/10	2								2	.016
1/11	1								1	.008
4/11	1								1	.008
5/11	1								1	.008

TABLE I—CONTINUED

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Fraction	Wilson Study	Wise Study	Melrose Study	Edward Everett School Study	Boston Study	Mitchell Study (Cook Book)	Mitchell Study (Wages)	Woody Study	Total	Percentage
1/12	5	1	1				442	269	718	5.693
2/12	1							3	4	.032
4/12	1		2						3	.024
5/12	2						31	9	42	.333
7/12	2						16	2	20	.159
8/12		1							1	.008
9/12							1		1	.008
10/12							3	2	5	.040
11/12	1	1					5	6	13	.103
1/15		1							1	.008
7/15				1					1	.008
9/15	1								1	.008
1/16	2	1							3	.024
3/16			1		2				3	.024
5/16	1							1	2	.016
7/16	1	1	1						3	.024
11/16	2								2	.016
15/16					1			2	3	.024
6/17	1								1	.008
7/17		1							1	.008
16/17		1							1	.008
1/18	1								1	.008
14/19					1				1	.008
1/20		1						2	3	.024
1/24	1							5	6	.048
5/24	1								1	.008
17/25	1								1	.008
18/31			1						1	.008
1/32	1								1	.008
5/32	1								1	.008
1/36		1							1	.008
6/100	1								1	.008
2/144								2	2	.016
Totals	1974	1161	97	297	2785	2666	1502	2131	12,613	100.005

veals a sizable basis for conclusions. Table I summarizes these data, and at the same time spreads them out in such manner as to make it possible to study the details discriminatingly.

The total fractions of previous studies amount to 12,613. Column (1) of Table I shows the spread of these fractions from halves to one-hun-

dred-forty-fourths; column 10 shows totals for each fraction; and column 11 reduces the data of column 10 to a percentage basis.

The other columns of Table I, columns 2-9, distribute the fractions of the various studies, giving totals at the bottom. The totals are Wilson,[5] 1974, Wise,[6] 1161; Wilson's Boston area studies,[7] columns 4, 5, 6, total 3179; Mitchell's two studies,[8] columns 7 and 8, total 4168; and Woody,[9] column 9, 2131.

Studies reported in columns 2, 3, 4, 5, and 6, of Table I are based upon the school pupil survey method.[10] They are in substantial agreement; slight disagreements are explained elsewhere.[11] Mitchell's Cook Book Study (column 7) brings up the scores on 8ths. Scores under 12ths increase in the Mitchell and Woody studies, columns 7, 8, 9, due to the dozen basis in industries studies. The increase of 6ths in the Woody study is unexplained; it may have occurred through reduction of 12ths by field workers who thought that fractions had to be in lowest terms to be right.

Table II summarizes returns from a much larger study of the business usage of fractions.[12] The data from this larger study, when combined with previous data, are believed to be adequate for final conclusions on useful fractions. They indicate the need for thorough-going simplifications of the work of fractions in the public schools.

This effort to discover the fractions of business usage extended over the better part of two years. The study was made in the Boston area, a great metropolitan center with a population of more than two million within a radius of a dozen miles and with the usual commercial and manufacturing activities of such a center.

Many businesses yielded no fractions, or fractions so few and so simple

[5]Wilson, G. M. *A Survey of the Social and Business Usage of Arithmetic.* Contributions to Education, No. 100, New York: Teachers College, Columbia University, 1919.

[6]Wise, Carl T. "Arithmetic Problems Arising in Various Occupations," *Elementary School Journal* (October, 1919), p. 118.

[7]See pp. 64-72 of Wilson, G. M. *What Arithmetic Shall We Teach?* Boston: Houghton Mifflin Company, 1926.

[8]Mitchell, A. Edwin. "Some Social Demands of the Course of Study in Arithmetic," Seventeenth Yearbook, Part I, National Society for the Study of Education, Bloomington: Public School Publishing Company. pp. 7-17.

[9]Woody, Clifford. "Types of Arithmetic Needed in Certain Types of Salesmanship," *Elementary School Journal,* XXI (March, 1922), p. 505.

[10]For school pupils survey method, see Chapter I of Wilson, G. M. *What Arithmetic Shall We Teach?* Chapter I.

[11]Wilson, G. M. *What Arithmetic Shall We Teach?* pp. 39-83.

[12]Dalrymple, Charles O. *Fractions in Business and Life.* Doctor's Dissertation, Boston University, 1934.

that days of observing yielded meager returns. The necessity of recorded results, forced the investigation into the larger and more complicated businesses to such an extent that *complicated business usage*, rather than

TABLE II

SHOWING A SUMMARY OF ALL THE FRACTIONS OF THE DALRYMPLE STUDY IN TERMS OF DENOMINATORS

(1) Units	(2) Different Fractions	(3) Sears Roebuck Co. Study	(4) *Boston Transcript* Study	(5) United Drug Co. Study	(6) Jordan Marsh Co. Study	(7) Hotels Study	(8) S. S. Pierce Co. Study	(9) A. Stocks, Bonds, etc.	(10) B. Bank Rates	(11) C. Foreign Exchange	(12) Total	Percentage
Halves	1	9,069	12,751	2,212	259	110	327	6,175	731	242	31,876	31.184
Quarters	2	6,671	12,717	956	177	29	89	2,624	12,911	296	36,470	35.678
Thirds	2	803		110	120	15	1				1,049	1.026
Fifths	4	18		4			1				23	.023
Sixths	5	2		100	11	8	1				122	.119
Eighths	7	2,555	12,880	267	1,174		9	3,665		268	20,818	20.368
Ninths	7	1		4	1						6	.006
Tenths	9	23		4							27	.026
Twelfths	11	4		76	843	46					969	.948
Fifteenths	5			2							2	.002
Sixteenths	14	682		154		4	2			101	943	.923
Twentieths	2	4		1							5	.005
Twenty-fourths	4	4					1				5	.005
Thirtieths	2			2			1				3	.003
Thirty-seconds	31	148	255	4				9,260	10		9,677	9.467
Thirty-sixths	4	4									4	.004
Fortieths	1						1				1	.001
Forty-eighths	1	1									1	.001
Fiftieths	1						1				1	.001
Sixtieths	1						1				1	.001
Sixty-fourths	8	74									74	.072
Hundredths	27	133									133	.130
2/144		3									3	.003
925/1000											1	.001
8/4											6	.006
Totals	149	20,199	38,603	3,896	2,585	212	435	21,724	13,652	907	102,220	100.00
Percentage												

the average adult usage, is shown in the returns. This difference is brought out in the contrast in results between the study in the Edward Everett District, Boston, (Table I, Column 5) in which halves alone made up 92.9 percent of all fractions,[13] and the results of the present study as summarized in Table II, columns 3 to 11 inclusive.

[13] See Table 24, p. 62 of Wilson, G. M. *What Arithmetic Shall We Teach?*

Table II is a summary table showing by denominators only the fractions occurring in the nine large units of the present study. These units are listed at the tops of columns 3 to 11 inclusive. Column 2 of Table I is interesting in showing the proportion of the various possible fractions that appear in the study of 102,220 fractions. For instance, in this study no fractions occur under sevenths. Only seven occur under ninths, where there is a possibility of eight different fractions. On the other hand, all forms of eighths and twelfths occur.

Columns 3 to 11 of Table II show interesting variations in fractions used in different lines of business. The fraction *one-half* occurs with reasonable frequency in all units. The same is true of *fourths*. *Thirds*, on the other hand, do not appear under the Boston Transcript unit, which is chiefly a summary of stock market quotations.

Eighths show a high frequency in many of the units, and ranks next after halves and quarters in the totals. In the Sears, Roebuck study, eighths occur in connection with inch measures and sizes. In the *Boston Transcript* study, they occur in connection with stock quotations. In the Jordan Marsh Company study, the frequency of eighths is accounted for in sales and inventories of yard goods, where the eighth of the yard becomes the most common unit of measure. Eighths also occur in the bank study under stocks and bonds and under foreign exchange.

The *twelfth* is also a highly specialized fraction. It occurs chiefly where there is inventory on a dozen basis. Twelfths in the Jordan Marsh Company study occurred in such departments as gentlemen's furnishing where collars, ties, etc., are dealt with in wholesale trade on a dozen basis, and where the inventory is made on the dozen basis.

The *thirty-second* is another highly specialized measure. It occurs in the bank study under bonds and in the *Boston Transcript* study under bonds. In the Sears, Roebuck study the thirty-second occurs chiefly as the fraction of an inch, in connection with hardware.

Sixteenths mount up under measures on an inch basis under Sears, Roebuck, and under parts of the pound under United Drug, and again under foreign exchange.

The details of Table II, summarizing highly specialized business fractions show some noticeable contrasts with columns 2, 3, 4, 5, and 6, of Table I. As previously indicated the pupil-survey method, discloses the larger proportions of simpler fractions in common usage outside big business.

On the other hand larger businesses add very few fractions beyond common usage of individuals as reported by the school pupil survey method. The chief change is the increase in proportions under *eighths, twelfths, sixteenths,* and *thirty-seconds* for reasons briefly indicated above.

The authors do not claim that all specialized fractions of business have been revealed in the present study. They each know personally of fractions situations not typically represented by the study; but these are more highly specialized fractions, are more difficult to secure, and when secured will not change the conclusions of this study.

The purpose of this article has been the fuller disclosure of the fractions of social and business usage. They are much simpler than the fractions of the schools. It may be remarked also, without fuller development at this time, that the operations and combinations of fractions in business are very, very simple in comparison with school practices. Is it possible that we have been wasting much school time on useless fractions? And in going beyond usage on a purely manipulative basis, have we not done much to confuse and defeat the child?

Needed mastery in fractions for common usage is limited to halves, thirds, fourths, eighths, and twelfths. Crossing of denominators seldom goes further than halves with fourths. Subtraction of fractions seldom occurs; Woody first noted this. Division of a fraction by a fraction almost never occurs. Indications are that this simple program of mastery in fractions can be best accomplished through an objective, non-manipulative procedure.[14] Any further program in fractions should be purely informational. Unusual fractions should be left to learning on the job, when and if needed; they are no part of the grade task of the schools.

[14]This statement is based upon early returns from a coöperative fractions experiment being conducted by the writer, for the school year, 1935-1936.

A SURVEY OF INSTRUCTIONAL PRACTICES AND EQUIPMENT USED IN OBSERVED LESSONS IN THE SOCIAL STUDIES IN GRADES SIX, SEVEN AND EIGHT, IN SELECTED CITIES OF THE MIDDLE WEST

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During the past quarter of a century educational surveys have been used extensively. Although many aspects of education such as retardation, finances, achievements of pupils, and the like have been discussed rather completely in these reports, the critical observations regarding instructional practices in classroom lessons have been very few and inadequate. During recent years methods of obtaining objective descriptions of teaching activities have been evolved.

This paper presents the results of a survey of instructional practices and equipment used in observed lessons in the social studies of grades six, seven and eight, in selected cities of the Middle West. To secure data concerning key activities and factors in the lessons observed, a check sheet containing a series of items grouped under various headings was devised. After wide reading covering all phases of this matter, and as a review of preliminary observation in the schools of Saint Paul, the following observable phases of classroom lessons were included on the blank:

Section I. *Objectives of lessons.*—The observer was asked to check the item which best described the most obvious objective of the lesson. (See Table I.) The objective is of considerable importance because the purpose in the teacher's mind largely determines the nature of the lesson.

Section II. *Instructional procedures used.*—The writer realized that all procedures could not be listed, but obtained all those which were found to be quite prevalent, and also left additional space for observers to add vital procedures. (See Table II.)

Section III. *Presentation of subject matter.*—This section showed whether the material was presented as a subject, correlated or fusion course, or in activity units. (See Table III.)

Section IV. *Types of assignments.* This section probed into the assignments given in the lessons together with the teacher's method of organizing the work for the class. (See Table IV.)

Section V. *Unit of instruction.*—This section brought out the teacher's method of organizing the subject matter for the recitation periods. (See Table III.) Effective organization is the key to success. The plan

of organization of subject matter indicates the teacher's judgment as to the most practical organization for effective learning on the part of the pupils.

Section VI. *Class organization.*—This section attempted to show through the methods by which classes were administered the manner of caring for individual differences within the teacher's classroom and the extent such differences were cared for. (See Table III.)

Section VII. *Equipment and material.*—This section was largely adopted from Baldwin's list of materials for the junior high school.[1] Data on the actual use of equipment should be useful to teachers and administrators in planning classroom equipment. (See Table V.)

Letters asking if they would be willing to assist in the survey were written to one hundred superintendents of school systems in cities of various sizes. A copy of the blank was included in each letter with an explanation that records for two lessons in the social studies were wanted for each of grades six, seven, and eight. Each lesson was to be reported upon a separate blank. Thirty-eight superintendents signified their willingness to participate in the survey. Six blanks were then mailed to the schools which volunteered their aid. Directions were given to observe ordinary daily lessons without notifying the teacher beforehand.

Two hundred observation reports of lessons observed during December, 1933 and January, 1934, were returned to the writer. At the same time the writer personally observed a group of fifty lessons. These were in the school systems of Hopkins, Minneapolis, Saint Paul, and South Saint Paul. The data from this group of fifty lessons were used for comparison and as a check upon the general body of observations. The survey analyzed only the occurrence of items, not their quality or the skill with which they were applied. The study thus furnishes a picture of important aspects of the instructional procedures and equipment used in typical social studies classes of grades six, seven and eight over the general area covered by this survey.

The findings of the survey are given in the succeeding tables. Data are given for the individual grades, six, seven and eight. On each table figures listed under Group I give the percentages for the two hundred reports submitted by the superintendents. Under Group II are given the percentages for the fifty lessons observed by the author. The items in the tables are assembled in the order of frequency of occurrence; those

[1] Baldwin, James Willis. *The Social Studies Laboratory* (New York: Bureau of Publications, Teachers College, Columbia University, 1929), pp. 51-54.

checked with greatest frequency are placed first in the table, and those checked the fewest times are placed last.

The most frequent objective seems to be the determination of pupils' mastery of facts in the text. This is shown by Table I. "Development of an understanding of the social order" receives considerable emphasis in

TABLE I

PERCENTAGES OF OCCURRENCE OF APPARENT OBJECTIVES

	Grade	6	7	8	Group I	Group II
1.	To determine how completely pupils have mastered facts in the text	30	51	43	42	36
2.	To develop understanding of the social order	13	11	17	15	42
3.	Finding and using facts for development of topic in a unit	36	16	29	28	10
4.	To develop effective habits and methods of study	14	14	5	11	10
5.	To develop interest of pupils in social study through activities planned and executed by pupils under teacher guidance	2	4	3	3	2
	Number of lessons tallied	75	68	57	200	50

Group I includes all the lessons observed by Superintendents for this study. The lessons in the first three columns are added together to make up the fourth column.

Group II includes lessons observed by the writer in Hopkins, Minneapolis, Saint Paul and South Saint Paul.

TABLE II

PERCENTAGES OF INSTRUCTIONAL PROCEDURES USED

	Grade	6	7	8	Group I	Group II
1.	Supervised Study	53	64	68	62	63
2.	Extensive questioning by teacher	62	13	54	43	48
3.	Discussion by teacher such as overview, preview, etc.	49	48	45	47	16
4.	Pupils volunteer personal experiences related to the topic	26	22	24	24	30
5.	Reports given on assigned topics studied independently	16	28	20	21	28
6.	Written review, or preview, to test pupils' knowledge	26	39	38	34	16
7.	Teacher illustrates topic by reference to personal experience	16	19	22	19	20
8.	Discussion of current events	6	21	19	15	12
9.	Visual stimuli presented	20	22	12	18	6
10.	Miscellaneous	10	14	17	12	12
11.	Application of general principles to local study situation	18	13	22	18	0
12.	Undirected Study	6	4	5	5	10
13.	Construction of models, mountings, and other items	16	8	7	10	0
14.	Dramatization of materials studied	4	1	3	2	0
15.	Class debate under formally adopted rules	0	4	0	1	2
16.	Planning for, or reporting upon, excursions to study local affairs	0	0	0	0	0
17.	Listening activities involving mechanical devices	0	0	0	0	0
	Number of lessons tallied	75	68	57	200	50

Directions to observers were to check all those activities which actually occurred in the lesson observed.

the classrooms. In Group II this objective received much more attention than in Group I. "Finding and using facts for development of topic in a unit" ranks third in frequency. The "development of effective habits and methods of study" received considerably less attention than any objective listed above. The "development of pupil interest in social study through activities planned and executed by pupils" was rarely observed, as it occurred only three times in Group I and twice in Group II. Considering the recent trend in our training schools of instruction, the writer would have expected the "development of effective habits and methods of study" to be a more prominent objective.

In general the objectives observed seem to indicate the prevalence of traditional procedures and little stress on the newer objectives, such as development of effective study methods and planning of activities by pupils under teacher guidance, stressed by modern educational theory.

Turning to Table II we find the analysis of instructional procedures. The one procedure standing out above the others is that of supervised study, which attained a percentage of occurrence of 62 in Group I and 63 in Group II. Extensive questioning by the teacher was observed in somewhat less than half of the lessons for both groups. In the lessons observed by the author, "extensive questioning" did not seem to indicate questions stimulating pupil judgment, since the use of a large number of questions by the teacher usually tested pupil memorization of more or less important details, not major concepts. Discussion by the teacher in the form of overviews and previews was the third most frequently used procedure. Its occurrence was observed much more in Group I than in Group II. The item of fourth greatest frequency of occurrence was the volunteering by pupils of personal experiences related to topics under discussion. Probably most educators will agree that this is a very encouraging tendency, as it is an evidence of pupil interest. Reports given by pupils on assigned topics studied independently rank fifth in order of frequency of occurrence. The percentage of occurrence in Group I was 21, and in Group II, 28. This procedure indicates a trend toward individual attention and development, and may also lead to the development of effective habits and methods of study. Written reviews or previews testing pupil's knowledge was the sixth item in order of frequency.

This activity was observed in 34 percent of the lessons in Group I and 16 percent in Group II. Illustration of topics by teacher's reference to personal experience comes seventh. This would seem to be a wholesome procedure for development of pupil interest, as it relates materials of

TABLE III

DATA ON ADMINISTRATIVE FACTORS

Grade	6	7	8	Group I	Group II
I Presentation of subject matter					
.....1. Subject matter taught as geography, history, civics, and so forth	88	79	63	79	30
.....2. Unified, correlated course in social studies, emphasizing subject matter	9	20	35	20	70
.....3. Activity units, no subject emphasized	2	0	1	1	0
II Unit of instruction					
.....1. Long study unit, such as Morrison unit	58	64	83	69	50
.....2. A unit of work started and completed in a single period	33	30	15	25	48
.....3. Series of unrelated activities, not a unit	8	4	3	5	2
III Class Organization					
.....1. Class as a whole	96	83	68	80	80
.....2. Any combination of 1, 3 and 4	6	10	29	17	10
.....3. Pupils in groups	6	4	10	7	10
.....4. Complete individualization of pupils' work	2	2	3	2	0
Number of lessons tallied	75	68	57	200	50

the textbooks to the affairs of everyday life. Discussion of current events was the procedure eighth in order of frequency. It seemed to receive equal emphasis in both Group I and Group II. Greater emphasis on this activity might be of value in these days of momentous public questions. Visual stimuli was represented in but 18 percent of the lessons in Group I and only 6 percent in Group II. The tenth item in order of frequency is listed as miscellaneous. This included all the various procedures added to the form list by observers. Most of these additions could have been classified under the other items in the list. One wonders why there was so little use of such activities as the construction of models, dramatization of materials studied, and class debate. The entire absence of any reference to class excursions in the lessons seems to indicate little effort to observe at first hand the workings of the social institutions or of geographic phenomena being studied. *"Listing Activities"* given on the blank, was a misprint, and the item should have been *Listening activities* such as occur with the use of phonograph or radio. Reports on these items were checked, however, by the data in Table V, where the use of phonographs and radios was listed. On the whole the most prominent activities seem to be wholesome ones, but the greater use of some of the important activities falling near the bottom of the table such as debates, dramatizations, and the like, would be of considerable value in achieving modern educational objectives.

Administrative factors, such as the organization of the subject, the unit of instruction, and the class organization have considerable effect upon the general nature of lessons. Table III shows that the majority

of lessons in Group I were presented according to the isolated subject plan. There seems to be considerable difference in this regard between Group I and Group II. The data for Group II show 70 percent of the lessons observed by the writer were of the unified and correlated social studies type. This is due to the fact that many of these lessons were observed in Saint Paul where this plan is used. Presentation of activity units emphasizing no particular subject was observed in only 1 percent of the lessons in Group I. The author found a total absence of this plan in the lessons personally observed.

The long study unit seems most prominent in the teacher's organization of daily work. Second highest frequency is shown for a unit of work studied and completed in a single period. Very few lessons were made up of a series of unrelated activities which did not seem to be a unit.

Both Group I and Group II rate 80 percent of the lessons as being taught under the "class as a whole" plan. The next highest class organization is any combination of the set-ups listed. Pupils working in groups is the third most popular plan of class organization, while complete individualization of pupils' work was rarely observed.

On the whole one would say that most of the lessons were presented as separate subjects, i. e., geography and history. The material was organized in large units of instruction, and four-fifths of the lessons were presented to the class as a whole.

The method of presenting the assignment naturally directs the student's method of preparation. The highest frequency of observation in regard to assignments is described as "Further work on problems in a

TABLE IV

PERCENTAGES OF ASSIGNMENT TYPES

Grade	6	7	8	Group I	Group II
1. Further work on problems in a unit already assigned	60	52	57	59	30
2. Study of several texts and sources according to teacher prepared plan					
.....A. No motivation observed.....	17	29	49	25	14
.....B. Motivation by teacher observed.....	2	0	19	7	2
3. Study certain pages or chapters in one text only...	14	16	8	12	30
4. No advance assignment given.....	9	10	3	7	26
5. Creative activity projects (surveys, etc.) brought in by teacher.....	17	1	8	2	2
6. Creative activities planned by pupils for execution under teacher guidance.....	6	5	8	2	0
Number of lessons tallied.....	75	68	57	200	50

unit already assigned." This is due no doubt to the fact that so much of the work was presented in large units. The second type of assignment required study of several texts and sources according to a teacher prepared plan. It is of considerable significance that more assignments of this type were given with no apparent motivation than was the case where the teacher definitely tried to motivate the work. It seems a hopeful tendency that the study of certain pages or chapters in one text only drops to third place in order of frequency. Where no advance assignment was given it may be possible that assignments had previously been made in the study of large units, or it may be a case of faulty teaching. Newer ideas in assignments, such as creative activity projects brought in by the teacher, or creative activities planned by the pupils for execution, occurred very rarely. If this type of thing is considered to be worthwhile by our training schools, it would seem that the need of emphasizing their value is very great.

Table V dealing with the equipment and material used in the lessons is given the list of items in the form in which it appeared in the observation blank, as the list does not lend itself to a frequency order reorganization. The figures here speak for themselves. They would indicate very little use of many valuable types of visual stimuli and educational equipment. It is probable that this is partially due to lack of equipment available. Such a condition could probably be improved if all social studies were organized around a social studies laboratory. The information in this table should make very clear to administrators and teachers the need of providing in their budgets for the purchase of needed instructional supplies for the social studies department. It may also be of value to indicate the many opportunities for enrichment that are being neglected in the daily class work in the social studies.

SUMMARY

Here we have a picture revealing the actual occurrences in two hundred and fifty lessons observed in thirty-eight school systems in the Dakotas, Minnesota, Wisconsin, Michigan and Iowa. The picture indicates in general the activities one would be likely to see upon stepping into a social studies class of the sixth, seventh, or eighth grades in this territory. The objective of the model lesson would be the determination of the degree to which pupils have mastered facts in the textbook. Observing such a lesson one would probably see a part of the period devoted to supervised study. There would be extensive questioning by the teacher,

TABLE V

Percentages of Types of Equipment Used

Grade	6	7	8	Group I	Group II
I Furniture and fixtures					
A. Blackboard	77	66	70	69	50
B. Bulletin board	26	38	38	34	12
C. Special cabinets and filing cases for maps, slides, etc.	20	19	17	17	0
D. Cupboards for tools, materials	17	25	17	20	2
E. Immovable seat desk units	66	79	70	82	88
F. Movable single desk units	30	11	23	14	10
G. Tables for two or more	2	8	7	3	2
II Books, periodicals, and papers					
A. Almanac	5	4	3	3	0
B. Encyclopedia	8	14	12	9	0
a. Children's general	8	22	15	19	2
b. Historical	5	4	7	5	0
C. Yearbooks					
a. Statesman's	0	8	5	4	0
b. American	5	1	5	2	0
D. Collateral readings					
a. Biographies	8	16	17	12	2
b. Geographical readers	22	23	8	20	8
c. National and state government bulletins	4	6	10	5	0
d. Historical documents	1	5	3	2	0
e. Historical fiction	12	3	8	11	4
f. Historical plays	1	5	3	2	0
g. Sourcebooks	12	16	19	12	0
h. Supplementary sets of texts	32	36	42	38	22
i. Workbooks or outline notebooks	8	13	21	16	14
j. Periodicals and newspapers used	1	8	8	5	10
III Maps, charts, atlases					
A. Maps					
a. Globes	38	39	17	26	12
b. American series	14	28	28	20	0
c. Political physical wall maps	57	60	49	52	46
d. Slated outline maps	5	17	10	10	16
e. Desk outline maps	10	0	12	14	0
B. Atlases					
a. Historical	10	5	5	4	0
b. Geographical	2	14	10	13	0
c. Charts and tables or graphs not in textbooks	4	7	3	3	0
IV Visual aids					
A. Topical collections of illustrations or clippings	9	23	17	17	10
B. Slides, films, etc.	4	2	3	3	2
C. Booklets, steamship and railway folders	14	16	12	12	0
D. Mounted wall pictures	14	23	15	20	0
E. Mimeographed sheets and outlines	6	23	28	19	2
F. Miscellaneous	0	0	3	1	4
V Unusual auditory exercises					
A. Radio programs	2	0	1	0	0
B. Phonograph records	0	0	0	0	0
C. Talks by experts, lecturers, etc.	4	1	1	1	0

TABLE V—*Continued*

Grade	6	7	8	Group I	Group II
VI Supplies					
.....A. Cardboard for construction	2	8	5	6	0
.....B. Cardboard for mounting	5	5	3	5	0
.....C. Soap, plastic clay or other material for modeling	6	8	7	6	0
.....D. Chart and graph paper	0	8	8	3	0
.....E. Drawing materials	13	19	15	16	0
.....F. Miscellaneous	0	4	0	3	0
VII Economic and industrial exhibits					
.....A. Minerals and rock collections	5	2	7	5	0
.....B. Economic and industrial specimens	6	8	3	5	0
.....C. Raw textile materials	6	5	3	6	0
.....D. Manufactured textiles	8	5	3	6	0
.....E. Miscellaneous	2	2	0	3	0
Number of lessons tallied	75	68	57	200	50

or preparation for discussion by the teacher, such as an overview. In the course of the lesson there is a fair probability that pupils would volunteer personal experiences related to the topic of the lesson. The chances would be about four out of five that the material would be presented as a subject. The work would probably be part of a long study unit of some nature as the Morrison unit. The class would in most cases be organized and dealt with as a whole. Sometimes one might find pupils working in groups, but very seldom, if ever, would there be complete individualization of the pupils' work. The assignment given would consist of further work on problems in a unit already assigned. Probably it would require the study of several texts and sources according to a teacher prepared plan. It is doubtful if the observer would note any definite effort at motivation by the teacher. Chances of seeing any creative activity projects are very small. In checking the equipment used, one would note the use of the textbook and sets of supplementary textbooks, the use of a bulletin board, and in most cases immovable seat desk units. There would likely be an encyclopedia of some kind, and papers for collateral readings. Also there would be a good chance of seeing a political-physical wall map in use. However, other types of visual aids, radio programs, phonograph records, talks by outside experts, modeling and construction supplies, or economic and industrial exhibits would seldom be found.

EDITORIAL

SOME PROBLEMS IN CURRICULUM MAKING

Among the many problems that engage the attention of the professional worker in the field of education there appears, and rightfully so, a growing concern over the curriculum, first as a means of furnishing boys and girls with better instruction and later as a means of building a better social order. In a field with so many ramifications there are naturally many problems in need of investigation. That this is true becomes increasingly apparent as curriculum construction passes through its more theoretical stages to the modification of practice.

There are three very common problems always facing the curriculum maker: (1) What are the purposes of education in general, in the different areas of learning, and at different levels of child development? (2) What subject matter, activities, and means will best accomplish these purposes? And (3) How can these means be best organized for teaching purposes? There are of course, other problems in the field of curriculum construction, but since many of the problems in this field do fall into these three categories, they may be employed to suggest some needed research.

The study of educational problems ordinarily involves a certain fairly well recognized sequence of mental operations: (1) the recognition and definition of a problem; (2) the survey of past experience (recorded in books and elsewhere) with the problem under consideration for ideas about what to do; (3) the formulation upon the basis of a preliminary survey of past experience of certain tentative generalizations (hypotheses) about how to proceed and possible solutions; (4) the critical examination of these tentative generalizations for verifiability, logical consistency and agreement with fact as found in past experience with the problem; and (5) a further appeal to experience made according to the conventions of science employing better controls, more systematic observation, and better instruments of measurements, when and if necessary.

The work in the field of curriculum construction to date has been largely concerned, as it should have been, with the preliminary aspects

of the problem: getting the problem clearly in mind, reviewing past experiences with the problem, and reaching certain tentative conclusions about what to do. The curriculum rehabilitation movement appears now, however, to have arrived at a stage where more attention must be given to its appraisal aspects: (1) appraisal in terms of past experience and already available information, and (2) appraisal in terms of new appeals to experience made according to the conventions of science.

The many curricula formulations now available almost everywhere, new courses of study, etc. are, of course, merely claimed or hoped for improvements in the curriculum that need now to be verified through careful investigation. The first three steps in solving curriculum problems appear to have progressed now to a point where steps four and five need to be given more attention. It would appear, now that we have these many new courses of study, that we should study them carefully in operation. The reasoned guess that some new formulation, however elaborate, will improve the situation must not of course be accepted on faith or as an accomplished fact merely because it appears to be promising. These further needs in the field of curriculum construction opens up a whole new field of research of great importance to field workers.

Aside from this more general problem of evaluation just referred to, there are also many other lesser problems of evaluation needing the attention of field workers. In the field of objectives, for example, there have appeared many formulations of the interests, needs, and wants of children and adults. If education is for all the people, to what extent do these formulations agree with the interests, needs, and wishes of all the people? In a democratic society this should probably represent an important field of investigation. There are doubtless, too, many new satisfiers of human wants that need to be discovered and verified. Then too the felt needs of people at different levels of maturity are different. While these interests, needs and capacities of people at different levels of development have been widely studied, there is doubtless room for much more investigation. There is much difference of opinion too about whether the child should be given what he wants or what society thinks he needs. In many respects the primary function of the school is to bridge the gap between the immaturity of the child and the maturity of society. The two systems of values are different. How then can we best bridge this gap? Then too there are many possible means to any desired objective. Which means shall we employ? Will it be necessary to evaluate each and every

new means individually and separately or can criteria be developed for this purpose? What are these criteria and what evidence do we have of their validity?

There is much difference of opinion too about how subject matter can best be organized for teaching purposes and of the relative merits of direct contact learning, observation and verbal communication. A hypothesis that the writer has frequently proposed is that whether one or another of these approaches to learning will be the most effective depends upon the capacity and developmental level of the learner and the nature of the subject matter to be taught. Generally speaking it seems, in the initial stages of new learning at all levels of development, and with immature minds whether so because of native capacity or training, and in the motor skill subjects, that direct contact learning is more effective than verbal learning. Direct contact learning is, however, slow and laborious and should wherever and as soon as possible give way to verbal learning.

The questions here raised are only a few of the many questions that one might raise in the field of curriculum construction. The general point of this editorial is that there are now many fairly well formulated theoretically promising curricula available in the form of courses of study that need to be carefully evaluated in practice to determine the extent to which they live up to expectations. Underlying these curricula are also many important problems of learning and teaching that need to be studied before or as a part of the program to put these curricula into operation. In all of these there is need for much good substantial research and undisputable evidence of the validity of old and new curricula.

A. S. Barr

REVIEWS

Address all communications relative to book reviews to Editor Kai Jensen, University of Wisconsin, Madison, Wisconsin.

The Teaching of Arithmetic: Tenth Yearbook of the National Council of Teachers of Mathematics (New York: Bureau of Publications, Teachers College, Columbia University, 1935), pp. vi + 289. $1.75.

The National Council of Teachers of Mathematics, for years interested only in Secondary Mathematics, have recently enlarged their scope so as to include Arithmetic in the grades, hence the justification for the present volume. The Council evidently sought guidance on the present volume from those who shaped the policy of the 29th Yearbook of the National Society for the Study of Education, many of the authors are the same; hence we have in the 10th Yearbook to some extent an extension of the 29th Yearbook, the same philosophy, the same fallacies. But some new blood is added and the shift in philosophy is in the direction of meaning and usefulness.

Many neat, complimentary reviews of the 10th Yearbook have appeared; the present review endeavors to be justifiably critical. It attempts a fair evaluation.

Chapter I by Brownell develops three theories of beginning arithmetic,—drill, incidental and meaning. The discussion of the drill theory is a caricature; no reputable author advocates what is here presented as the "drill" theory. To it are assigned most of the ills in the teaching of arithmetic. All other ills are assigned to the incidental theory. And it must be admitted that the possibilities of the poor procedure under these theories are well developed. The "meaning" theory takes to itself the good points of the drill and incidental theories, adding only an emphasis on the well known principle that "meaning shall precede drill." The meaning theory should be labelled a composite or compromise theory and credit distributed accordingly. This would seem better and fairer than merely making a case in Huey Long style, setting up men of straw and neatly knocking them down; in the field of education we should give credit where due and avoid the practices of the demagog. The profession recognizes the value of meaning first, of much incidental learning through experience, and finally of the need for mastery of useful facts through systematic drill.

Chapter 2 by Brueckner is a survey of instruction in grades 4, 5, 6, in the larger cities. It shows in a straightforward manner what is happening to-day in schools "taught by mature selected individuals of training considerably above the average." In general, these more capable teachers are doing the routine job of a computational mastery and problem solving, using the textbook as a basis, and with little variation. Some provision is made for individual differences, and some few teachers apply arithmetic to business in meaningful ways. The author of this chapter is unduly concerned that the psychological and sociological possibilities of arithmetic are not more fully realized

in the classrooms of America. There is much of fallacy in these possibilities of arithmetic as developed during the last few years. If applied to spelling, they would certainly set us back two generations and give us again the old word list of 10,000 to 12,000 words. We do not want that in spelling nor do we in arithmetic. With meaning first and much of experience as a basis, what we want in arithmetic, as in spelling, is perfect mastery of the useful tool material, and then its meaningful application.

Chapter 3 by Buckingham is on Informational Arithmetic, is interesting, well written and very worthwhile. The idea of Informational arithmetic has been a growing concept for twenty years. Most will agree that meaning and informational background should precede, accompany, and follow all computational arithmetic. The chapter is controversial, a man of straw is set up. No leader would advocate that type of computational work here opposed. The argument for early teaching of arithmetic is weak; if applied to reading, it would require that teaching of reading be started at age two or as soon as the child begins to talk. If the plan for teaching the rationale of the number system were applied to reading, it would require teachers to go into word origins with grade children, a doubtful procedure in beginning reading. Dr. Buckingham loses perspective on some of his topics. Most of what he advocates for children should be left for training courses for teachers.

In Chapter 4, the writer ends a good general review of arithmetic with a misinterpretation of the significance of surveys of social usage of arithmetic by adults. Another man of straw is thus set up. The plans for socialization of arithmetic, as developed in the remaining pages of the chapter, are plans with which no progressive student of arithmetic would find fault.

Hanna in Chapter 5 shows by actual check for four months on six rooms of children in grade 3 and grade 6, the extent to which child experience and the needs of numbers in the activity program can provide the basis for the teaching of arithmetic. *This chapter is a valuable contribution.* The objective check on needs of children and adults is the most valuable basis for determining what to teach in arithmetic and when. This study confirms previous studies on the simplicity of actual needs in arithmetic.

Johnson in Chapter 6 reports on economy resulting from teaching addition and subtraction of common fractions by the decimal method, i e., by changing the common fractions to decimal equivalents. There is a significant saving of time and accuracy. He wisely asks that the work in fractions be deferred to later grades and made simpler; surveys of adult usage support these recommendations, but do not support the decimal equivalency method. The differences between the needs of fractions in common usage and in structural engineering, for example, are not recognized by the author.

In Chapter 7, Miss Judd and Dr. Morton furnish a concise summary of present practices in courses in arithmetic for teachers as shown by summaries of questionnaire returns from 129 teacher training institutions.

Overman contributes a thoughtful chapter on transfer in arithmetic. Much of the worry over transfer is obviated when the work in arithmetic is simplified on the basis of common adult usage; complete coverage of the useful arithmetic is easily possible.

Repp in Chapter 9 carries forward his story of isolated drills as presented in the 29th Yearbook, but the treatment is

broader, better balanced, saner,—a chapter worth reading, and suggestive of problems for further study.

The next three chapters are in the nature of general discussions on mathematics. They are by Smith, Thiele, and Wheeler, respectively. Dr. Smith shows unusual wisdom in appraisal of the Yearbook and other movements in elementary mathematics. *No one should miss his chapter.* He urges omission of useless processes and phases of processes, and meaningless arithmetical terms.

Many would not agree with Dr. Thiele in his assignment of the better plan of teaching arithmetic to the mathematicians and the less acceptable plan to the pedagogs; but few can fail to follow his conclusions in favor of understanding before drill, simple work for young children, and the possibility of a much higher level of work from children than the average now reached.

Dr. Wheeler applies the new Gestalt psychology of learning to the teaching of arithmetic. What he says about fundamental values, understanding, and true motivation is only too true, sadly true. What he omits on how to ascertain true values and how to organize teaching, are equally true and equally much needed.

In the final chapter on Long Division, Professor Upton summarizes and extends his well known plans for teaching long division on an automatic, no error, basis.

By and large, the 10th Yearbook is a defense of the stand which the disciplinarians took in the 29th Yearbook of the National Society for the Study of Education. It is controversial style in most chapters. It claims too much, more than is necessary. Many have contributed to the development of arithmetic; why not give them credit. Colburn in his early work had the objective business view point so much needed to-day. The disciplinary view point led to formalization. Mc Murray suggested needed eliminations and corrections in procedure. Thorndike took first steps into complete analysis of topics and steps for teaching. Knight and the others carried this further; some carried it too far. More recently, studies of adult usage of arithmetic have indicated further steps toward sanity in teaching arithmetic to children. And so the story goes. The 10th Yearbook forgets most of its historic background on the teaching of arithmetic. Starting with defense of the 29th Yearbook positions, it improves its position by claiming for itself the good points of all opposing plans and leaving to the opposition only their weaker points as exemplified by the most hopeless teachers.

The 10th Yearbooks needs, therefore, to be read very critically, and with large allowances for any statements on what others advocate. Possibly a sense of humor would help as one reads the overstatements on pet ideas of some of the authors. The newer authors escape this controversial style and make their contributions with less effort.

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The Teaching of Arithmetic: Tenth Yearbook of the National Council of Teachers of Mathematics (New York: Bureau of Publications, Teachers College, Columbia University, 1935), pp. vi + 289. $1.75.

The present reviewer takes this opportunity to congratulate the editor on the neatness and adequacy with which *The Tenth Yearbook* is presented to its readers. The book as a whole is more distinguished by restatements of positions which have received previous consideration and interpretation of data which

have appeared elsewhere than it is distinguished by the presentation of new data which are both adequate and important. On the whole, it consolidates a position in arithmetic rather than advancing (or retreating) to other positions. Such consolidation is useful.

Brownell's position for more thought and meaning as integral phases of learning arithmetic is convincing in its context. His closing sentence is noteworthy: "The basic tenet in the proposed instructional re-organization is to make arithmetic less a challenge to pupil's memory and more a challenge to his intelligence." It occurs to the reviewer to suggest that when a more powerful pedagogy is directed toward the problems of learning arithmetic, the correlation between arithmetical competence and intelligence may be raised from the present dismal .4 or .5 to even .8 or .85. In a friendly fashion, it might be pointed out, however, that Brownell omitted the experimental evidence to justify his condescending attitude toward drill and his enthusiastic attitude toward meaning as a tool of learning in arithmetic. Perhaps, since there is no antagonism between memory and intelligence, we had better challenge both memory and intelligence instead of either one alone.

Buckingham's chapter on informational arithmetic contains much sound sense, and the context, with its frequent philosophical asides, would prove interesting reading for the layman as well as the pedagogue. Buswell repeats with conviction the fairly well accepted conclusion that arithmetic should be judged primarily in terms of its social values.

Those teachers who are afflicted with the compulsion for a place for everything and everything in its place and express this compulsion in a demand for a lockstep curriculum in arithmetic, well insulated and sound-proofed from what else goes on during the day, will be very much disturbed at the possibilities of arithmetic in an activity program in contrast to the older idea of keeping various phases of elementary education on their own shelves. Hanna's report of arithmetic in an activity program in a sense is a two-edged sword, since he shows arithmetic to be far more useful in real life than many of the activity protagonists have been willing to admit. In other words, those curriculum makers who have dealt rather stingily with arithmetic so far as time allotment is concerned, as well as general appraisal of its value, will receive small comfort from Hanna's contribution in this volume.

The present needless impedimenta in arithmetical notation are vividly set forth in Johnson's chapter on economy. How the whole subject could be simplified if civilization as a whole could make up its mind to use only decimals and the metric system instead of persisting in its continuation of the unnecessary *patois* of fractions and our jungle of denominate numbers. Overman's contributions reënforces the general position that Buswell took earlier in the book. Those interested in the technology of instruction, without forcing a contrast to the philosophy of education, will profit by a study of Repp's discussion of drill. Unfortunately, it contains an incorrect report. As a matter of fact, Panlasigui's research showed that proper standards for drill, and the keeping of a progress chart facilitated the learning of more able pupils since they did have success to be aware of and hence be stimulated by, and Repp correctly reports this finding. The statement that dull pupils do better on non-standardized material than they do on standardized material is an incorrect report of Panlasigui's findings.

The fact is that dull pupils seem to do about as well on non-standardized material as upon standardized material. There is no statistical difference. The findings seem reasonable as dull pupils could not be stimulated by success since they have relatively little amounts of it by which to be stimulated. Upton's discussion of long division closes the *Yearbook*. While on certain minor points, students of long division might not be particularly impressed with the comments made, the reviewer knows few, if any, single treatments of long division which taken as a whole handle this "black beast" of arithmetic any better.

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JONES, ARTHUR J. *Principles of Guidance. (Second edition)* (New York: McGraw-Hill Book Company, 1934), pp. xxviii + 456. $3.00.

The first edition of *Principles of Guidance*, published in 1930, was written "with the purpose of making clear the real meaning and significance of guidance, especially as it is related to the public schools," rather than to serve as a handbook for those participating in guidance activities. This second edition has the same general purpose. The author states in his preface that the second edition was "undertaken largely because of the many changes that have taken place during the last few years in our social, economic, and industrial life and in the offerings of our schools and in their organizations." In other words, it is an effort to adapt the material presented in the first edition to changed conditions.

The book is divided into four parts, as follows:

Part I. The Meaning and Purpose of Guidance.
Part II. Methods of Investigation in Guidance.
Part III. Methods of Guiding Students.
Part IV. The Results of Guidance.

The author's point of view is briefly expressed on page 41 in these words: "Guidance is a part of all education and an essential part. Education is the broader, more inclusive term; guidance is an aspect or element in education. . . . Wherever choices, adjustments, and interpretations are to be made and wherever the individual needs help in making these choices, adjustments, and interpretations, there is guidance."

Under methods of investigation in guidance are discussed, to the extent of nearly 200 pages, school records; exploratory activities; tests; estimates of personality traits; self-analysis; the work of the psychiatrist and visiting teacher; case methods; astrology, phrenology, physiognomy, graphology; methods of securing facts about general conditions of school attendance, courses of study, schools and colleges; methods for investigation of occupations.

Nearly 250 pages are devoted to methods of guiding students, attention being given to guidance in selection of subjects, curriculums, schools, vocations, and leisure-time activities. Many illustrations of practice in different school systems are presented.

Part IV consists of a brief closing chapter (16 pages) which deals with the development of the guidance movement, changes in emphasis, the effect of the guidance movement on education, efforts to evaluate guidance, and the future of guidance.

While the writer's conception of guidance and his views concerning the relation of guidance to education differ substantially from those of the author of this

book, there can be no doubt that Dr. Jones has made a significant contribution to the literature of this important subject. He has brought together a wealth of material concerning the need for guidance, methods of studying the individual and the opportunities open to him, and methods and techniques of rendering guidance service that deserves the careful attention of all who are interested in youth. Even if he has not fully realized his purpose of "making clear the real meaning and significance of guidance," he has made progress in that direction in this second edition. And his thinking will challenge others to carry the effort forward.

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SIMPSON, MARGARETE. *Parent Differences of Young Children*. Contributions to Education, No. 652 (New York: Bureau of Publications, Teachers College, Columbia University, 1935), pp. viii + 85. $1.50.

Two hundred and fifty boys and two hundred and fifty girls ranging in age from five to nine years were tested by the controlled interview method to determine their father and mother preferences. Each age group comprised fifty boys and fifty girls. The data were analyzed to uncover any sex and age differences, and the relation of preferences to such factors as punishment by either parent, gifts received from either parent and play of parents with children. The interview consisted of two parts: In the direct approach the question "Whom do you like best at home?" was asked in the course of an informal and friendly conversation. In the indirect approach the subjects were asked to react to various pictures and stories involving a child and both parents. For example, one of the pictures concerns a boy who is returning home from a visit in the country and the child is asked "Whom will he like best to see when he gets home?".

A larger percentage of children of both sexes expressed preference for the mother except for the five-year old girls of whom sixty percent stated they preferred the father. For both sexes from the age of six to nine the father-preference tends to decline. The boys of all ages and the girls of five prefer the parent of the sex opposite their own while the girls over six prefer the parent of the same sex.

For the older children of both sexes negative relationships were found between punishment and preferenced and the author concludes that corporal punishment administered by the father may be one of the reasons for this relationship. For both sexes and all ages there are low positive relations between preference-score and gifts received.

The intelligence of the child does not seem to play a consistent role in his preference of one or the other parent. According to the reasons which the children themselves gave they like the parent best who caters to their material wants, plays with them most, and punishes them least.

The study is an interesting one but one is tempted to raise the question, "What is the significance of the results?". The data give a picture of parent-preferences under the conditions in which the children were living at the time. The important question would seem to be, "How firmly rooted are these preferences? Can they be rather easily modified or are they modified only with difficulty?". And finally, "What is the effect of a given type of preference upon the subsequent development of the child?".

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State University of Iowa

RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

BEERS, F. S. "The Human Side of This Testing Business," American Council on Education (Washington: 744 Jackson Place, 1936), 34 pp.

The author presents a critical survey of the college testing program particularly from the point of view of the uses of test results.

BLANTON, ANNIE WEBB. "The Child of the Texas One-Teacher School," *The University of Texas Bulletin*, No. 3613 (Austin: The University of Texas, April, 1936), 111 pp.

After presenting the plan of the study, the author offers a comparison of the native ability of rural and urban pupils as shown by individual and group mental tests; a comparison of rural and urban pupils in reading ability; a comparison of rural and urban pupils as to handwriting; a comparison of achievement in spelling of rural and urban pupils; a comparison of rural and urban pupils in the four fundamental operations in arithmetic, a comparison of rural and urban pupils in knowledge of the English language and ability to use English correctly; a comparison of rural and urban pupils in knowledge of geography, a comparison of rural and urban pupils in understanding of American History; a comparison of rural and urban pupils as to physical status; a comparison of the social and economic status and advantages of rural and urban pupils; a study of the relationship of high and low intelligence quotients to scores made on school subjects and to physical status and social status; a study of the Spanish-speaking pupils; and a comparison of the school houses and the teachers in the rural and urban districts studied.

BROWN, E. J., and BYALL, R. D. "A 'Consumer's Research' in School Supplies," Kansas State Teachers College of Emporia, Bureau of Information, XVI, No. 9 (September, 1936), 44 pp.

After stating the problem and summarizing previous investigations, the authors present specifications for different items of school supplies.

CONRAD, EDITH UNDERWOOD. "Trends in Manuscript Writing" (New York City: Bureau of Publications, Columbia University, 1936), 29 pp.

This bulletin contains a discussion of changes in handwriting, reasons for the introduction of manuscript writing, how to teach handwriting, activities developed through needs and interests, method and procedure, building standards in the grades, remedial treatment, studies relating to writing skills, decoration and illumination, and a bibliography.

ENGELHARDT, N. L., and FRED. *Survey Manual for the Business Administration in Public School Systems* (New York: Bureau of Publications, Teachers College, Columbia University, 1936), xvi + 156 pp.

The materials are organized about the following: control and organization; personnel, income management; budgetary procedure; payment of service; administration of supplies and equipment; building program; maintenance and operation; cafeteria management; research; and office management.

FURBAY, JOHN HARVEY. *A Workbook for Observation in Practice Teaching* (New York: Macmillan Company, 1936), ix + 261 pp.

The materials in this workbook are organized about the following topics: the first day; planning the course; the daily recitation; questioning technique; reviews; teaching study habits; socialized class procedure; project teaching; grading and marking; standardized tests and scales; experimentation in methods of teaching; and psychological principles at work.

GABLE, SISTER FELICITA. "The Effect of Two Contrasting Forms of Testing upon Learning," The Johns Hopkins University Studies in Education, No. 25 (Baltimore: The Johns Hopkins Press, 1936), 31 pp.

After summarizing previous investigations, the author presents the results of two experimental studies of the influence of daily check tests and longer announced and announced unit tests in six classes in Biology with a total of 274 students. The longer unit tests were found to be more effective than the daily check tests.

GREEN, P. G. "An Annotated Bibliography of the History of Education in Kansas," Kansas State Teachers College of Emporia, *Bulletin of Information*, XV, No. 9 (September, 1935), 33 pp.

An annotated bibliography of the history of education in Kansas organized about the following topics: A. General Accounts, B. Kindergarten and Elementary Education, C. Public School Systems Considered by Localities, D. Teaching Profession, Normal School, etc., E. Public Secondary Education, F. Aspects of Central Machinery of the Public Schools, G. Biography of Educators, H. Private and Denominational Education, I. Vocational and Industrial Education, J. Negro Education.

HARRIS, T. H. "Louisiana Program of Curriculum Development," State Department of Education of Louisiana, No. 324 (Baton Rouge: Department of Public Education, August, 1936), 166 pp.

The author discusses organization for curriculum study, purposes and needs of a state-wide study of the curriculum; basic philosophy and guiding principles in curriculum development; the aims of education; the pupil's needs; purposes, and interests; nature and scope of the curriculum; the relation of subject matter to the curriculum; and teaching procedures.

LEE, J. M., and SEGEL, D. "Testing Practices of High-School Teachers," *Bulletin of the United States Department of the Interior*, No. 9 (Washington: Office of Education, 1936), 42 pp.

After stating the problem, the authors raise and discuss the following questions: How often do teachers give tests? What types of questions do teachers use in their self-made tests? What are the practices of teachers relative to final examinations? Who corrects the tests? What uses do teachers make of tests? What are the attitudes of teachers toward the giving

of tests? What are the attitudes of teachers toward various types of tests?

LOW, A. A. "Studies in Infant Speech and Thought," *University of Illinois Bulletin*, XXXIII, No. 39 (Urbana: University of Illinois, May, 1936), 70 pp.

A quantitative analysis of the continuous speech record of two infants from the point of view of the development of grammar and sentence structure. Bibliography.

MILLS, H. C., and ECKERT, R. E. "The Anticipatory Examination," Studies in Articulation of High School and College, XIII, Series II, Bulletin 1 (Buffalo: University of Buffalo, 1936), 54 pp.

SARBAUGH, MARY E. "Articulation in English," Studies in Articulation of High School and College, XIII, Series II, Bulletin 2 (Buffalo: University of Buffalo, 1936), 18 pp.

STRABEL, EUNICE. "Academic Success of Various Age and Experience Groups," Studies in Articulation of High School and College, XIII, Series II, Bulletin 3 (Buffalo: University of Buffalo, 1936), 44 pp.

ECKERT, RUTH E., and MILLS, H. C. "Patterns of High School Performance," Studies in Articulation of High School and College, XIII, Series II, Bulletin 4 (Buffalo: University of Buffalo, 1936), 53 pp.

WAGNER, MAZIE EARLE. "Studies in Academic Motivation," Studies in Articulation of High School and College, XIII, Series II, Bulletin 5 (Buffalo: University of Buffalo, 1936), 59 pp.

SARBAUGH, MARY E. "Effect of Home Surroundings on Academic Achievement," Studies in Articulation of High School and College, XIII, Series II, Bulletin 6 (Buffalo: University of Buffalo, 1936), 31 pp.

MILLS, H. C. "Differences between High School and College in Methods of Instruction," Studies in Articulation of High School and College, XIII, Series II, Bulletin 7 (Buffalo: University of Buffalo, 1936), 31 pp.

ECKERT, R. E. "The Significance of Curriculum Choice," Studies in Articulation of High School and College, XIII, Series II, Bulletin 8 (Buffalo: University of Buffalo, 1936), 22 pp.

WAGNER, MAZIE EARLE. "Reading Ability in High School and College," Studies in Articulation of High School and College, XIII, Series II, Bulletin 9 (Buffalo: University of Buffalo, 1936), 12 pp.

A series of bulletins dealing with various phases of the articulation of high school and college reporting research carried on under a grant from the General Education Board to the University of Buffalo.

National Education Association, Research Division, "Safety in Pupil Transportation," *Research Bulletin*, XIV, No. 5 (Washington: November, 1936), 39 pp.

Following the statement of the problem, the author discusses the selection of the problem of safe transportation, the selection of competent drivers, safe equipment, safe transit practices, the selection of safe routes, safety promotion, business practices effecting pupil safety, and implications of the study.

PHARES, E. E., and BROWN, E. J. "A Self-Rating Scale for High School Principals," Kansas State Teachers College of Emporia, *Bulletin of Information*, XVI, No. 6 (June, 1936), 34 pp.

After summarizing previous investigations, the authors present a self-rating scale for high school principals with data relative to its validity.

RUCH, G. M., *et al.* "Schemata for the Analysis of Drill in Fractions," University of Iowa Studies, X, No. 2 (Iowa City: University of Iowa, November, 1936), 58 pp.

This monograph contains data for the teaching of fractions, the analyzing and constructing drills in common fractions and mixed number, and the appraisal of instructional materials. Bibliography.

STODDARD, GEORGE D., and WELLMAN, BETH L. *A Manual of Child Psychology* (New York: Macmillan Company, 1936), v + 117 pp.

This manual treats the following topics: trends in child psychology; methods of research; motor development; sensory discrimination; concepts and thinking; language; growth of intelligence; meaning of intelligence; learning; play; development of artistic ability; personality aberations; character; and meaning of personality.

WAGONER, LOVISA C. *Observation of Young Children* (New York: McGraw-Hill Book Company, Inc., 1935), ix + 297 pp.

A laboratory manual including the following topics: nursery school (organization, records, equipment); nursery school activities; attitudes and personality; language; judgment, imagination, memory; emotional development; adult-child relationships; problems. Bibliography.

WOOD, R. G., *et al.* Bulletin of Research Activities of the Ohio Scholarship Tests (Columbus: State Department of Education, September, 1936), 182 pp.

This bulletin presents a summary of investigations carried on under direction of the Ohio Scholarship tests of the State Department of Education including studies of the learning and teaching of various school subjects at different grade levels.

WOOTTEN, KATHLEEN WILKINSON. *A Health Education Workbook* (New York: A. S. Barnes and Company, 1936), pp. xix + 273.

Contains exercises on the teacher and health, the parent and health, healthful school living, safety education, physical education, physical defects, and various difficult health problems.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

MILLER, ANDREW J. "The College Success of High School Graduates of Exceptional Ability," *Pittsburgh Schools*, XI (September-October, 1936), pp. 13-35.

This is a study of the post-high school records of a group of high-school graduates chosen for aid because of exceptional ability.

MULROY, ESTHER FARREN. "Marks Made following a Program of Remedial Instruction," *School Review*, XLIV (December, 1936), pp. 753-758.

A study in which remedial instruction in reading is found to reduce the number of failures in high school.

EXPERIMENTAL STUDIES OF LEARNING AND TEACHING

SEAGOE, MAY V. "Qualitative Wholes: Classroom Experiments," *Journal of Educational Psychology*, XXVII (November, 1936), pp. 612-620.

The author points out in her summary that large units are not necessary wholes, and that wholes recognized by adults are not necessary wholes for children.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

DOCTORS' THESES UNDER WAY IN EDUCATION, 1936-1937

CARTER V. GOOD
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This is the seventh annual list of Doctors' theses under way in education to be published in the January number of the *Journal of Educational Research*. Space limitations permit printing of only those titles not previously reported in the January, 1934, 1935, and 1936 numbers. Therefore, in order to make a reasonably complete canvass of doctoral studies under way at present, it is necessary to examine these four lists, 1934-37. Those dissertations which have been completed since being listed as under way may be discovered through canvassing the annual bibliographies of research in education, published by the United States Office of Education.

The present compilation includes 549 thesis subjects—456 new titles not found in the 1934-36 lists (a few of them were reported before 1934), and 93 titles so different from those reported for the same candidates in the 1934-36 lists that it seemed desirable to print them this year (some are entirely new problems, while others represent further delimitation of an old problem). The number of titles reported in the 1934-36 lists and still under way (but not included this year) is as follows: 1936, 164; 1935, 91; and 1934, 66; a total of 321. These 321 titles (still under way) printed in the 1934-36 lists, the 93 titles radically changed from the 1934-36 compilations, and the 456 new titles represent a grand total of 870 studies in progress at the present time. Approximately one-half of the candidates have begun work on their problems within the past twelve months, while the other half have been at work a year or more. Since a few of the graduate departments with relatively small doctoral registrations in education submitted only new topics not previously listed, the total number of dissertations under way probably is near 900. In view of the fact that only approximately half this number of degrees is awarded annually, it suggests that an average of roughly two years is required for the completion of the thesis. No doubt the recent economic and social disturbance, with its accompanying effect on school systems and educational institutions, has been a factor in delaying the progress of graduate work for many students.

TABLE I

NUMBER OF GRADUATE THESES COMPLETED IN EDUCATION, 1927-1935

Year	Doctors' Theses	Masters' Theses
1927	217	662
1928	167	1367
1929	250	1289
1930	323*	2259*
1931	387	2490
1932	357	2375
1933	370	3229
1934	469	2763
1935	384	2368

*More than twelve months represented—July, 1929, to September, 1930.

The number of Doctors' and Masters' theses completed over the period, 1927-

1935, is as found in Table I. Of course, a number of Masters' degrees are granted without the thesis as a requirement.

It is hoped that this compilation of studies in progress may be of service to graduate students, professors, and field workers by way of preventing unnecessary or mere random duplication of effort, promoting a measure of coördination in research, revealing centers of interest, and even suggesting areas for future investigation. In other years attention has been directed to instances in which students were working on the same problem, each apparently without knowledge of the current efforts of other investigators. Rather than for two doctoral candidates to spread over the entire area of the history of teacher education in the United States (as was planned a few years ago), with much duplication in parts of the study and probable omissions in other parts, it seems reasonable to consider delimitation of the scope of each study and coördination of the two, so as to produce complementary and supplementary contributions. It at least seems worth while for workers attacking the same problem to know the scope and approach of similar contemporary investigations. In the instance of duplication of effort described above, one of the men decided subsequently to study the development of the state program for the certification of teachers.

In another case of random, and even careless, duplication, a doctoral candidate who had spent nearly a year in investigating the problem of certification of teachers in a certain state was very much surprised in 1935 at the appearance of a printed dissertation on the same subject (and state) from another university. He could have found the latter thesis reported as under way in the January, 1933, number of the *Journal of Educational Research*, at least a year before he began work on the problem. This worker subsequently turned to another problem in the same state, a history of one of the higher institutions. The point of these comments is directed not so much against the desirability of two or more workers attacking the same large problem, or parts of it, as against mere random duplication of effort.

Occasionally a student has a thesis title on file at two graduate schools, in some instances the same problem and in other cases different titles. Possibly a transfer of graduate credit has been made from one school to another without full information having reached all concerned in the first institution attended. In the present compilation an effort has been made to list only the last title and institution.

A few of the titles in the 1937 list do not belong strictly to the field of education, but are included because they were forwarded by a graduate department of education and involve partial fulfillment of the requirements for a degree in education. Illustrations are: "The Principles of Accounting for Decedents' Estates in the State of New York," "An Historical Analysis of the Changing Business Life of New York City," and "The Conflict and Adjustment of Two Religious Cultures." At the suggestion of one graduate school certain of their titles were omitted, for example, "A Concordance to Those Writings of Ovid Outside the Accepted List," "A Phytosociological Study of the Vegetation in an Oak-Hickory Forest," "The Disappearance of French Syllable Accent in the English Language between Chaucer and Spenser," and "Americanized Spanish Words in American English." Such studies seem rather foreign to the field

of professional education, and the school in question stated that in the future its dissertations would be limited to the field of education. This same question might well be considered by at least some of the other graduate departments and schools of education. This year, for the first time, studies have been listed from the Yale Department of Race Relations because of their pertinent implications for education.

It will be observed that some of the titles are so lacking in specific formulation as merely to name an area or subject field; in all probability such topics will undergo much sharper delimitation with the passage of time as the student gains in knowledge of research procedure and insight into the problem. In a few instances the title is too wordy; it is not expected that the thesis problem, sources of data, techniques of investigation, and educational applications can be described completely in the title.

In all cases the name of the student, the thesis title, and graduate institution are given, and in most instances the major adviser or advisory committee is listed. No differentiation is made in this compilation between Ph.D. and Ed.D. problems.

The institutions which have sent titles for inclusion in the 1936-37 list are: American University, Arizona, Boston, Bryn Mawr, Buffalo, California, Catholic University, Chicago, Cincinnati, Claremont Colleges, Colorado, Colorado State College of Education, Columbia, Cornell, Duke, Fordham, George Washington, Harvard, Illinois, Indiana, Iowa, Johns Hopkins, Kansas, Kentucky, Michigan, Missouri, Nebraska, New York, North Carolina, North Dakota, Northwestern, Notre Dame, Ohio, Oklahoma, Oregon, Peabody, Pennsylvania, Penn State, Pittsburgh, Rutgers, St. Louis, Southern California, Stanford, State College of Washington, Syracuse, Temple, Texas, Virginia, Washington, Western Reserve, Wisconsin, and Yale.

1. Adams, Harlen M. "The Junior College Library in Relation to Instructional Procedures." Stanford. Kefauver.
2. Afros, Jacob L. "The Effects of Educational-Vocational Guidance in the New York City Junior High Schools upon Truancy and Delinquency." New York. Brown, Long, and West.
3. Agensky, Esther. "Instructional Programs in Special Classes." Pennsylvania. Garver.
4. Albright, D. M. "The Legal Authority of the Office of State Superintendent of Public Instruction in Pennsylvania." Pittsburgh. Yeager.
5. Alderman, Everett. "Effect of Size of Type on Comprehension." Pittsburgh. Yoakam.
6. Ale, Ida Greeley. "An Experiment in Children's Reading: Classroom and Individual Tests in Logical Reading." New York. Radosavljevich.
7. Alexander, J. D. "The Use of Motion Pictures in Teaching the High Jump." Peabody.
8. Allard, Lucille. "Recreation and the Teacher: A Study of the Leisure Activities of Certain Teachers in the Elementary Schools of Long Island." Columbia. McGaughy.
9. Allen, C. H. "Legal Principles Governing Practice Teaching in Teachers Colleges, Normal Schools, and Public Schools." Peabody.
10. Allen, Howard. "Certain Phases of Canadian Education." Syracuse. Smith.

11. Ambrose, Luther. "The Public Academies of Kentucky." Kentucky. Ligon.
12. Anderson, Archibald. "Development of Graduate Work in American Universities." Ohio State. Good.
13. Anderson, Eva. "Financial Support for Washington's Public Schools." Washington.
14. Anderson, Francis E. B. "The Founding and Developing of Church Boarding Schools in the Old Northwest." Columbia. Hunt.
15. Anderson, H. W. "Certain Legal Aspects of Student Personnel Administration in Public Higher Education." Peabody.
16. Annett, Thomas. "A Study of State and County Supervision of Public School Music." Cincinnati. Pechstein and Good.
17. Appel, Madeleine Hunt. "A Study of Certain Aspects of the Aggressive Behavior of Young Children." Bryn Mawr. Forest.
18. Arent, Palmine. "The Development of Nationalism in the Social Studies of the First Four Grades of the Elementary School Curriculum from 1914-1930." Columbia. McGaughy.
19. Armacost, George H. "The High School Principal's Annual Reports." Columbia. Briggs.
20. Armstrong, Watson. "A Procedure for Setting Up a Program of Instruction for Out-of-School Farm Boys." Kentucky. Hammonds.
21. Ashton, Philip F. "The Measurement and Improvement of Reading Skill at the Freshman College Level." Washington.
22. Atyeo, Henry C. "A Study of Certain Aspects of the School Excursion in the United States, Particularly As Used by the Secondary School History Classes in Taking Trips to Museums." Columbia. Woodring.
23. Ayres, Louisa Youngs. "An Appreciation of Music." Oregon. Leighton.
24. Bachur, George. "An Analysis of Recent Textbooks in Philosophy of Education." Michigan. Trow.
25. Bacon, Elizabeth. "Cultural Change in Central Asia." Yale. Loram.
26. Bailey, Donald W. "Adjustment in Transition from School to College." Yale. Hill.
27. Bailey, F. L. "Selected Factors in the Social Background and Educational Achievement of Rural Elementary School Children in Western Illinois." Columbia. Dunn.
28. Baird, Jesse. "The Private Secondary Schools of Kentucky." Kentucky. Ligon.
29. Baker, Ida M. "The Development of Testing Materials for Measuring Thinking in Quantitative Situations." Ohio State. Charters.
30. Banks, Anna K. "An Evaluation of Attitudes and Interests Developed in Home Economics Courses in Oklahoma." Oklahoma. Rinsland.
31. Barber, Joseph E. "A Comprehensive Plan for a Secondary School Department of Educational and Vocational Guidance." Buffalo. Cummings.
32. Barbour, J. Richmond. "Current Practice of the Activity Program." Yale. Gambrill.
33. Barclay, George. "The Relationship between Efficiency in Vision and Certain Sensori-Motor Skills." New York. Nash, Deaver, Lawton, and Skinner.
34. Barden, John Glenn. "A Suggested Program of Teacher Train-

ing in the Sankuro District, Congo Belge." Columbia. Carney.

35. Barker, Lincoln. "A System of 'Visible Records' for the College Registrar's Office." New York. Creager.
36. Barnes, Joe M. "Certain Educational Problems of Boone County, Missouri." Missouri. Carpenter.
37. Baruch, Dorothy W. "A Study of Behavior Adjustments in Young Children as Coexistent with Certain Emotional Tensions in the Interparental Relationships." Claremont Colleges.
38. Baumeister, Edmund J. "Historical Development of Secondary Education in the Society of Mary." Ohio State. Eckelberry.
39. Beck, Elton Wayne. "Equations Predicting Demonstrable Gains in Arithmetic in Terms of N Factors." Iowa. Knight.
40. Beck, Hubert Park. "The Social Composition and Social Ideas of Boards of Trustees of American Universities." Columbia. Counts.
41. Beck, Walter H. "Early Lutheran Education by Synods." Temple. Kuehner.
42. Beggs, Walter K. "A Model Twelve-Grade School Plant for Small Communities." Nebraska.
43. Bell, Lotta E. "A Critical Analysis of Teacher Training as Administered in the Seventh Day Adventist Church." Arizona. Clarson.
44. Benkert, J. M. "Objectives and Policies in High School Administration." Pittsburgh. Buckner.
45. Bennett, Chester Clarke. "Background and Interests of Children Having Difficulty in Reading in the Primary Grades. Columbia. Gates.
46. Bennett, John Newton. "The Selective Value of Granting Scholarships in Discovering and Winning Students Who Should Go to College." New York. Reed.
47. Bennett, Margaret. "An Evaluation of Orientation in High School and Junior College." Stanford. Hand.
48. Bentley, Jerome H. "A Guidance Project in the Y.M.C.A. of the City of New York." Columbia. Strayer.
49. Bergstresser, John L. "The Prediction of Academic Achievement for Men in the College of Letters and Science." Wisconsin. Fowlkes.
50. Bickel, L. G. "An Evaluation of the Tentative Proposed Curriculum for Pretheological Education in the Preparatory Schools of the Evangelical Lutheran Synod of Missouri, Ohio, and Other States, with Recommendations for Further Revision." Nebraska. Rosenlof.
51. Billhartz, W. H. "Early Finding of Youth Possessed of College Ability." Pittsburgh. Hutson.
52. Bimson, O. H. "An Analysis and Evaluation of the Administrative Philosophies of Leaders in the Field of Public School Administration in the United States." Nebraska.
53. Bingham, N. Eldred. "A Study of the Changes Produced in a Group of Ninth and Tenth Grade Pupils by a Unit in Nutrition." Columbia. Powers.
54. Bird, Charles A. "The Control of Teachers by School Board Regulations." Fordham. Cronin.
55. Black, E. H. "The Place and Function of Subject Matter in the Public Schools of Bristow, Okla-

homa." Colorado State College of Education. Frasier.

56. Bliss, Ruby. "A Study of the Philosophy and General Aims of Civic Education Needed for the United States in the Present and Immediate Future, Including an Application to a Specific School Offering." Nebraska. Rosenlof.

57. Booth, George Clive. "A Study of Mexican Education." Southern California. Burton.

58. Bowling, Cecil. "The Objectives of Social Intelligence Evaluated by Contemporary Educational Theory." Oregon. Leighton.

59. Bown, Frederick. "Investigation of the Effects of a General Typewriting Program in the Junior High School upon English Usage and Spelling." Washington.

60. Boyd, Elizabeth N. "A Diagnostic Study of Students' Difficulties in General Mathematics in First Year College Work." Columbia. Reeve.

61. Boyles, R. E. "Problems and Procedures in the Administration of High School Curricula." Pittsburgh. Buckner.

62. Brandt, LeRoy. "Socio-Geographical Influences on the Techniques of Evangelism amongst Protestants in the United States." New York. Hamilton, Horne, and Skinner.

63. Brickman, William W. "The Educational Philosophy of Gottfried Keller." New York. Meyer, Horne, and Radosavljevich.

64. Bridgman, B. F. "Urbanization of Africans." Yale. Loram.

65. Brodhead, John H. "A Study of the Present Status of Negroes in the High Schools of Philadelphia." Temple. Bolton.

66. Brooks, Daniel A. "Integration as an Aim in Education." Pennsylvania. Garver.

67. Brooks, G. A. "Responsibility of Secondary Education." Colorado. Davis.

68. Brooks, Harold Bennett. "Secondary School Cumulative Records and Reports: Their Function, Form, and Administration." Southern California. Raubenheimer.

69. Brouillette, J. W. "A Study of the Third Phase of the Peabody Fund (1905-1914)." Peabody.

70. Brown, Edward J. "Guidance in Secondary Schools." Yale. Hill.

71. Brown, Kenneth L. "The Financial and Economic History of Pennsylvania, 1775-1789." Temple. Morse.

72. Bryan, W. Thomas. "Educational Beliefs of High School Teachers." Yale. Tilton, Brubacher, and Hill.

73. Bucher, Jonas. "Social and Economic Background of Prospective Teachers Graduating from Accredited Pennsylvania Institutions in June, 1936." Pennsylvania. King.

74. Bunker, S. "Culture Changes Due to Christianity among a South African Native Tribe." Yale. Loram.

75. Burch, Willa Carter. "Clinical Practices in Progressive Education." Pennsylvania. Garver.

76. Burns, Mae C. "A Historical Survey and Philosophical Evaluation of the Curriculum at Hunter College." Fordham. Marique.

77. Burts, Mary F. "A Study of Play as a Factor in Character Education." New York. Lloyd.

78. Butler, J. Donald. "The Philosophy of Andrew Martin Fairbairn."

New York. Horne, Meyer, and McCollum.

79. Calvert, Everett T. "An Investigation of Reading Readiness." Yale. Gambrill.
80. Campbell, G. W. "The Courts and Public School Support in Kentucky." Kentucky. Ligon.
81. Capps, F. O. "The Selection and Organization of Conservation Materials for High School Sciences." Missouri. Watkins.
82. Carlisle, John. "Factors Determining Curricula for Slow-Learning Pupils at the Secondary School Level." California. Williams.
83. Carmichael, Omer. "The Public School Audit." Columbia. Engelhardt.
84. Carpenter, G. W. "Sociological Concomitants of Government and Mission Policy in Central Africa." Yale. Loram.
85. Carroll, Elinor. "What Is Good Reading, as Ascertained by the Practices of Good Readers and the Intentions of the Authors of Novels?" New York. Barnes.
86. Cerveny, George R. "An Examination of the Vernon L. Parrington Method of Literary Interpretation." New York. Barnes, Horne, and Boardman.
87. Chamberlain, Robert S. "Ministerial Attitudes toward Mental Hygiene." New York. Hamilton.
88. Chambers, Mary. "A Plan for Better Articulation between the Junior and Senior High Schools in New York City." Fordham. Redden.
89. Chen, Ting-hsuan. "A General Survey on Guidance Services in California Secondary Schools." Stanford. Proctor.
90. Chiang, Tsai Hwa. "Reading and Study Habits of College Students." Michigan. Woody.
91. Childs, Gladwyn Murray. "A Bantu Culture in Relation to Religious Education." Columbia. Elliott.
92. Cho, Seung Hak. "A Proposal for a System of Education Suited to Korea." Wisconsin. Clapp.
93. Christy, Van A. "Music for Glee Clubs and A Cappella Mixed Choruses: A Study and Selection of the Most Suitable Octavo Music and Music Books." Columbia. Dykema.
94. Clement, Ralph. "Principles of Art Education." Pittsburgh. Yoakam.
95. Cohen, Samuel. "The Objectives of Adolescent Organizations." Columbia. Case.
96. Coleman, Maurice L. "School Board Procedure." Missouri. Carpenter.
97. Collins, Henrietta. "A Survey of Private Secondary Schools for Girls." Pennsylvania. King.
98. Colton, H. J. "Debt Service in Relation to Financial Distress of School Districts." Pittsburgh. Yeager.
99. Conmy, Peter. "History of Public School Support in California." California. Swift.
100. Conner, Forrest E. "The Contribution of Objective Tests to an Organized Program of Guidance." Iowa. Newburn.
101. Coppens, Verle Frances. "A Study of Teacher Training in Scotland." Columbia. T. Alexander.
102. Costello, Helen. "What Is an Orthogenic Backward Child?" Pennsylvania. Garver.
103. Coulburn, John. "The Selection of Teachers in Large City School Systems." Columbia. Elsbree.
104. Cox, Walter Albert. "A Study of

the Expressed Preferences of 3,000 Junior High School Pupils for Certain Physical Education Activities." Columbia. Williams.

105. Coxe, Charles. "Special Education (Orthogenic) Changes Necessary in Curriculum and Organization to Meet the Social Needs of Orthogenic Backward Children." Pennsylvania State. Koos.

106. Coyner, Ruth E. "The History of Teacher Training in American Universities before 1900." George Washington.

107. Craig, Samuel Baughman. "The Comparative Efficiencies of Three Modes of Presenting Classroom Material to Deaf Students in a College for the Deaf." American University. Johnson.

108. Cramer, J. F. "Financing Education in the Australian States." Oregon. Huffaker.

109. Crawford, G. C. "The Diagnosis of Certain Difficulties in the Solution of Problems in Arithmetic." Chicago.

110. Crespi, Alberta. "Teacher Personnel in the Extra-Territorial Possessions of the United States." Fordham. Cronin.

111. Cressey, Paul Goalby. "The Sociology of Motion Pictures." New York. Thrasher.

112. Cunningham, Harry A. "Rooms, Service, Furniture, and Equipment Needed in Four-Year State Teachers College for the Training of Intermediate Grade Teachers in Science." Columbia. Powers.

113. Cunningham, Ruth. "An Analysis of the Activities and Adjustment Difficulties of Retail Salespeople." Michigan. Trow.

114. Cureton, Thomas K. "Swimming Tests and Scales." Columbia. Williams.

115. Darlington, Meredith W. "An Evaluation of the Elementary Individualized Instructional Materials Developed at the University of Nebraska from the Standpoint of Economy of Teacher Time and of Pupil Achievement." Nebraska.

116. Davis, Edwin W. "A Technique for the Functional Analysis of Positions in an Occupation." Columbia. Kitson.

117. Deady, Carroll F. "Teacher Tenure in the Parochial Schools in the State of Michigan." Notre Dame. Kuntz.

118. Dean, G. A. "Student Guidance in the University." Nebraska. Worcester.

119. Decker, Charles E. "Nature and Improvement of Correspondence Instruction for Teachers." New York. Myers.

120. Denniston, A. B. "A Study of the Professional Development of a Selected Group of Teachers." Pittsburgh. Gould.

121. Diederich, Paul B. "The Vocabulary of Latin Literature." Columbia. Briggs.

122. Dimmick, Earl A. "Remedial Program in Reading." Pittsburgh. Yoakam.

123. DiNapoli, Peter John. "Homework in the New York City Elementary Schools." Columbia. McGaughy.

124. Dixon, Fred. "An Evaluation of the Home Room." Missouri. Saupe.

125. Dixon, Henry Aldous. "The Administration of State Permanent School Funds as Illustrated by a Study of the Management of the Utah Endowment." Southern California. Hull.

126. Donahue, Francis J. "State Aid to

Catholic Schools." Fordham. Cronin.

127. Doscher, Nathan. "A Critical Analysis of the Visual Aids Used in Teaching Safety on Streets and Highways." New York. Lloyd, Meredith, and Radosavljevich.

128. Drake, Leland N. "The Clerk of the Board of Education." Ohio State. Reeder.

129. Drake, Lloyd B. "Required and Optional Expenditures for Public Services in Oklahoma." Oklahoma. Bender.

130. Drazin, Nathan. "A History of Jewish Education during the Periods of the Second Commonwealth and of the Tannaim (515 B.C. to 220 A.D.)." Johns Hopkins. Franklin.

131. Dresser, Henry O. "The Physics and Body Mechanics of Golf." New York. Lloyd, Peiper, and West.

132. Drummond, Laura W. "A Study of Recommendations of Undergraduate Students and Alumni of Liberal Arts Colleges concerning Instruction on Marriage and the Family." Columbia. Judy-Bond.

133. DuBois, Goddard. "Physical Education in Germany (Since the World War.)" Columbia. Williams.

134. Duckrey, James. "Relative Deficiency of the O. B. in Different Functions and Different Types of Subject Matter." Temple. Lund.

135. Easom, Percy H. "Educational Legislation in Mississippi, 1860 to 1930." Peabody.

136. Efron, Alexander. "The Comparative Teaching of Secondary School Physical Science in the United States, France, and Soviet Russia." Columbia. Powers.

137. Ehrlich, Maxwell. "A Study of the School Population of the Staten Island Continuation School." New York. Zorbaugh.

138. Eicher, James E. "Professional Status of Superintendents." Pittsburgh. Buckner.

139. Eisner, Harry. "Early Impressions of Intelligence and Industry of Elementary Algebra Pupils, Based upon Classroom Observation." Columbia. Symonds.

140. Elliott, L. P. "A Curriculum Study of Concepts Suitable for the Course in High School Chemistry." Kansas. Bayles, Turney, and Kent.

141. Emens, John R. "A Study of State Administration of Teacher Personnel." Michigan. Moehlman.

142. Emerick, Lucille. "Predicting Success in Music Education for Adults." New York. Hesser, Creager, West, and Zorbaugh.

143. Emery, June. "Relating Fields of Training for Social Intelligence with Illustrations in Geography." Oregon. Leighton.

144. Engle, F. A. "Mathematics in State Teachers Colleges." Kentucky. Adams.

145. English, J. Colin. "State Code for Public Education." Columbia. Engelhardt.

146. Entwisle, Thomas. "Trends in the Cost of Public Education in Pennsylvania." Temple. Owen.

147. Epstein, Bertram. "The Repetition of Wrong First Responses in Multiple-Choice Learning Situations." Columbia. Lorge.

148. Ervin, Dana R. "Centralization of Education in West Virginia." Kentucky. Adams.

149. Eskridge, T. J. "Growth in Understanding of Geographic Concepts,

Grades Four to Seven." Duke. Brownell.

150. Evans, Walter. "A Survey of the Financial, Administrative, and Educational Conditions of Fourth Class School Districts in the State of Pennsylvania." Pennsylvania. Garver.

151. Ezell, Lon B. "A Study of Certain Causal Factors in Inter-State Migration of College and University Students." Texas. Ayer.

152. Failor, Leona. "A Study of the Classification Tests Used in Penal Institutions." Nebraska. Worcester.

153. Faulkner, Donald. "The Development and Conflict of Principles of Higher Educational Administration." Ohio State. Klein.

154. Fawcett, Harold P. "An Analysis of Errors in High School Algebra with Suggestions for Remedial Instruction." Columbia. Reeve.

155. Fee, Edward M. "A Study of the Origin and Growth of the Several Forms of Vocational Industrial Education in Philadelphia Prior to 1917." Pennsylvania. Ash.

156. Ferguson, A. C. "Educational Article in the Texas Constitution of 1876." Texas. Eby.

157. Field, Elmer. "Trends in the Cost of Public Education in Pennsylvania." Temple. Owen.

158. Fields, Ralph R. "Identification of Guidance Problems in a Four-Year Senior High School (Phoenix, Arizona)." Stanford. Hand.

159. Findlay, James Franklin. "The Origin and Development of the Work of the Dean of Men in Higher Education." New York. Reed, Creager, and Horne.

160. Fiss, Joan. "The Visiting Teacher and Personnel Administration." Syracuse. Hilton.

161. Fleming, J. W. "Prognostication of Success in Trade School Work." Pittsburgh. Goldberger.

162. Fleming, Robert. "Factors Affecting the Adjustment of Children Brought Up in a Foreign Culture." Chicago.

163. Floto, W. H. "Effect of Supervisory Program on Learning." Pittsburgh. Yoakam.

164. Foster, W. Y. "The Educational Contributions of James M. Greenwood." Missouri. Carpenter.

165. Fox, George D. "Colonial School Masters in Maryland (1635-1775)." Johns Hopkins. Bamberger.

166. Fox, Richard. "An Investigation to Determine the Relationship of Personality Traits to Choice of Vocation in the Secretarial Social Work and Teaching Fields." New York. Wood.

167. Foy, Zed L. "Implications for Guidance and Curriculum in a Study of Boise High School Graduates." Stanford. Kefauver.

168. French, Harold P. "A Study of What Parents Wish in Socio-Economic Status for the Teachers of Their Children." New York. Dearborn.

169. Frost, Hazel. "An Evaluation of Primary Outcomes Developed in Home Economics Courses in Oklahoma." Oklahoma. Rinsland.

170. Frost, S. E. "A Study of the Relationship between Organized Educational Institutions and the Radio." Columbia. Kilpatrick.

171. Gainsburg, Joseph C. "Experimental Investigation of a Homogeneous Grouping Method in a New York City School." New York. Dearborn.

172. Gallagher, Buell G. "The Social

Opportunity of the Negro College." Columbia. Kilpatrick.

173. Gardner, Carl A. "Public Secondary School Alumni Organizations in the United States." New York. Cox.

174. Garnett, Wilma Leslie. "The Validation of a Remedial Program in English for College Freshmen." Iowa. Greene.

175. Gebert, H. G. "A Study of the Achievement of Students in Three Lutheran Colleges of Pennsylvania." Pittsburgh. Yeager.

176. Geiger, C. Harve. "The Educational Policy of the Presbyterian Church in the U. S. A." Columbia. Evenden.

177. Gellermann, William. "The American Legion as Educator." Columbia. Raup.

178. Ghiradella, R. "A Descriptive Study of Unsponsored Clubs and Other Groups in a Local Area in New York City." New York. Thrasher.

179. Gibson, Joseph E. "Planning in the Administration of Public Education in Mississippi." Columbia. Strayer.

180. Gillette, Roderic. "Criteria for Selecting Physical Education Personnel in Teacher Training Institutions." New York. Nash.

181. Gilmore, Gertrude. "Methods of Parents in Dealing with Preschool Children." Columbia. Jersild.

182. Glasgow, Merle W. "Representative Supreme Court Decisions of Oklahoma Affecting School Budgets." Oklahoma. Bender.

183. Gleitz, Florence M. "Supervision of Education in the Community (an Analysis of Significant Cases in Present Practice)." New York. Cox, Brown, Borgeson, and Dearborn.

184. Goetsch, Helen B. "The Influence of the Economic Status of Parents upon the Educational Opportunity of the Youth of Milwaukee in 1935-36." Columbia. Clark.

185. Goldfeld, Abraham. "Housing as a Factor in Juvenile Delinquency in a Local Area." New York. Thrasher, Parker, and Zorbaugh.

186. Goldstein, Harry. "Visual and Auditory Determinants of the Rate of Reading." Columbia. Gates.

187. Gordon, Mary Glaser. "A Critical Evaluation of Kindergarten." Harvard. Rulon.

188. Gore, George William. "The In-Service Professional Improvement of Negro Public School Teachers in Tennessee." Columbia. Evenden.

189. Gould, C. M. "An Analysis of Mental Activities Involved in Reading and Interpreting Arithmetic Problems." Chicago.

190. Grady, Harlan. "Motivation in the Teaching of Vocal Music." Texas. Gray.

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tional Opportunities of Students." Stanford. Sears.

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Economic Study." Columbia. Dunn.

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in North Carolina since 1860." North Carolina. Knight.

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vate Correspondence School Enrollee." Columbia. Cyr.

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of Public Instruction, 1886-1890." Virginia. Smithey.

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Training and Re-Certification of Teachers, with Special Reference to New York State." New York. Meyers, Speer, and Borgeson.

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Promoting Functional Education." Nebraska.

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Center in the Administration of a Program of Curriculum Enrichment through Supervised Correspondence Study." Nebraska.

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